DEVELOPMENT SERVICES DEPARTMENT
ENVIRONMENTAL COORDINATOR
450 110th Ave NE., P.O. BOX 90012
BELLEVUE, WA 98009-9012

OPTIONAL DETERMINATION OF NON-SIGNIFICANCE (DNS) NOTICE MATERIALS

The attached materials are being sent to you pursuant to the requirements for the Optional DNS Process (WAC 197-11-355). A DNS on the attached proposal is likely. This may be the only opportunity to comment on environmental impacts of the proposal. Mitigation measures from standard codes will apply. Project review may require mitigation regardless of whether an EIS is prepared. A copy of the subsequent threshold determination for this proposal may be obtained upon request.

File No. 20-122611-LO

Project Name/Address: Brar Kaur Residence 2190 140th Pl SE

Planner: David Wong

Phone Number: 425-452-4282

Minimum Comment Period: 06/03/2021

Materials included in this Notice:

☒ Blue Bulletin
☒ Checklist
☒ Vicinity Map
☒ Plans
☐ Other:

OTHERS TO RECEIVE THIS DOCUMENT:
☒ State Department of Fish and Wildlife / Sterwart.Reinbold@dfw.gov; Christa.Heller@dfw.wa.gov;
☒ State Department of Ecology, Shoreline Planner N.W. Region / Jobu461@ecy.wa.gov; sepaunit@ecy.wa.gov
☒ Army Corps of Engineers Susan.M.Powell@nws02.usace.army.mil
☒ Attorney General ecyolyef@atg.wa.gov
☒ Muckleshoot Indian Tribe Karen.Walter@muckleshoot.nsn.us; Fisheries.fileroom@muckleshoot.nsn.us

SEPA Checklist Reviewed by:
David Wong on 5/13/21

Development Services

SEPA Environmental Checklist

The City of Bellevue uses this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions

The checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully and to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions.

You may respond with “Not Applicable” or "Does Not Apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies and reports. Please make complete and accurate answers to these questions to the best of your ability in order to avoid delays. For assistance, see SEPA Checklist Guidance on the Washington State Department of Ecology website.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The city may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Background

1. Name of proposed project, if applicable Brar / Kaur Residence
2. Name of applicant Hamid Korasani
3. Contact person Hamid Korasani Phone (425) 214-2280
4. Contact person address 6608 110TH AVE. N.E. KIRKLAND, WA. 98033
5. Date this checklist was prepared 12/1/2020
6. Agency requesting the checklist City of Bellevue

DW

7. Proposed timing or schedule (including phasing, if applicable)

N/A

8. Do you have any plans for future additions, expansion or further activity related to or connected with this proposal? If yes, explain.

No

9. List any environmental information you know about that has been prepared or will be prepared, that is directly related to this proposal.

Geotechnical Engineering Study

10. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

None

11. List any government approvals or permits that will be needed for your proposal, if known.

None
Clearing & Grading Permit
Building Permit

DW

12. Give a brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

Filed assessment of the work and existing conditions caused by land alteration (previously done); and furthermore to obtain field data of the existing structures/elements to develop a set of plans to address the outstanding corrective actions related to Critical Areas Land Use, and prepare Permit documents(CALUP) and related requirements suitable for applying for the permit so the rehabilitation program (If any) can be engaged by their contractor(s).

13. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and the section, township and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The project is located in the rear yard of an existing single family residence located at 2190 140TH PLACE SE BELLEVUE, WA 98007.

Environmental Elements

Earth

1. General description of the site:
   - ☐ Flat
   - ☐ Rolling
   - ☐ Hilly
   - ☑ Steep Slopes
   - ☐ Mountainous
   - ☐ Other _____

2. What is the steepest slope on the site (approximate percent slope)? 36%

greater than 40% prior to unpermitted grading work

DW

3. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

Dense, sandy Advance Outwash
Ragnar-Indianola Association (RdE)
Alderwood gravelly sandy loam (AgC)

4. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

no

5. Describe the purpose, type, total area and approximate quantities and total affected area of any filling, excavation and grading proposed. Indicate the source of the fill.

No import or export of soil. The majority of the affected area was regraded

6. Could erosion occur as a result of clearing, construction or use? If so, generally describe.

No

7. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? 35%

DW

8. Proposed measures to reduce or control erosion, or other impacts to the earth, if any.

Landscaping
Erosion Control regulated by BCC 23.76

Air

1. What types of emissions to the air would result from the proposal during construction, operation and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

None

2. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

None

3. Proposed measures to reduce or control emissions or other impacts to air, if any.

None

DW

Water

1. Surface Water
   a. Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

No

   b. Will the project require any work over, in or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

No

   c. Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of the fill material.

None

   d. Will the proposal require surface water withdrawals or diversions? Give a general description, purpose and approximate quantities, if known.

N/A

   e. Does the proposal lie within a 100-year floodplain? N o
   If so, note the location on the site plan.

DW

f. Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No

2. Ground Water
   a. Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

No

   b. Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals…; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

None

DW

3. Water Runoff (including stormwater)
   a. Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Most of the affected area is covered with landscaping

   b. Could waste materials enter ground or surface waters? If so, generally describe.

No

   c. Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

No

   Indicate any proposed measures to reduce or control surface, ground and runoff water, and drainage pattern impacts, if any.

N/A

DW

Plants

1. Check the types of vegetation found on the site:

- [x] deciduous tree: alder, maple, aspen, other _____
- [x] evergreen tree: fir, cedar, pine, other _____
- [ ] shrubs
- [x] grass
- [ ] pasture
- [ ] crop or grain
- [ ] orchards, vineyards or other permanent crops
- [ ] wet soil plants: cattail, buttercup, bulrush, skunk cabbage, other _____
- [ ] water plants: water lily eelgrass, milfoil, other _____
- [ ] other types of vegetation _____

2. What kind and amount of vegetation will be removed or altered?

None is proposed to be removed. Additional tree, shrubs, and plants are proposed to be added to the affected area.
See landscape plan on sheet L1

Vegetation was removed from the RVA and NGPA without permit. Proposed condition includes areas of lawn where previously vegetated.

3. List any threatened and endangered species known to be on or near the site.

None

4. Proposed landscaping, use of native plants or other measures to preserve or enhance vegetation on the site, if any.

Additional tree, shrubs, and plants are proposed to be added to the affected area.
See landscape plan on sheet L1

DW

5. List all noxious weeds and invasive species known to be on or near the site.

None

Animals

1. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. Examples include:

   Birds: ☐hawk, ☐heron, ☐eagle, ☐songbirds, ☐other None

   Mammals: ☐deer, ☐bear, ☐elk, ☐beaver, ☐other None

   Fish: ☐bass, ☐salmon, ☐trout, ☐herring, ☐shellfish, ☐other None

2. List any threatened and endangered species known to be on or near the site.

None

3. Is the site part of a migration route? If so, explain.

No

4. Proposed measures to preserve or enhance wildlife, if any.

N/A

DW

5. List any invasive animal species known to be on or near the site.

None

Energy and Natural Resources

1. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

N/A

2. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No

3. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any.

N/A

DW

Environmental Health

1. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill or hazardous waste, that could occur as a result of this proposal? If so, describe.

No

   a. Describe any known or possible contamination at the site from present or past uses.

None

   b. Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

None

   c. Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

None

DW

d. Describe special emergency services that might be required.

N/A

e. Proposed measures to reduce or control environmental health hazards, if any.

N/A

2. Noise

a. What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

None

b. What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

None

c. Proposed measures to reduce or control noise impacts, if any.

None

Noise is regulated by BCC 9.18

DW

Land and Shoreline Uses

1. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

The current use of the site and surrounding properties is single family residential. The proposed project will not affect the current land uses on nearby or adjacent properties.

2. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to non-farm or non-forest use?

No

   a. Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling and harvesting? If so, how?

No

3. Describe any structures on the site.

Existing single family residence Retaining walls

DW

4. Will any structures be demolished? If so, what?

No

5. What is the current zoning classification of the site? R-5

6. What is the current comprehensive plan designation of the site? Residential

7. If applicable, what is the current shoreline master program designation of the site?

N/A

8. Has any part of the site been classified as a critical area by the city or county? If so, specify.

Yes, Steep Slope Critical Area.
See Site plan

9. Approximately how many people would reside or work in the completed project? 4

10. Approximately how many people would the completed project displace? 0

11. Proposed measures to avoid or reduce displacement impacts, if any.

None

12. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any.

None

DW

13. Proposed measures to ensure the proposal is compatible with nearby agricultural and forest lands of long-term commercial significance, if any.

None

Housing

1. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

none

2. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

none

3. Proposed measures to reduce or control housing impacts, if any.

N/A

Aesthetics

1. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

8 feet

2. What views in the immediate vicinity would be altered or obstructed?

None

DW

3. Proposed measures to reduce or control aesthetic impacts, if any

None

Light and Glare

1. What type of light or glare will the proposal produce? What time of day would it mainly occur?

None

2. Could light or glare from the finished project be a safety hazard or interfere with views?

No

3. What existing off-site sources of light or glare may affect your proposal?

None

4. Proposed measures to reduce or control light and glare impacts, if any.

None

Recreation

1. What designated and informal recreational opportunities are in the immediate vicinity?

N/A

2. Would the proposed project displace any existing recreational uses? If so, describe.

No

DW

3. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any.

None

Historic and Cultural Preservation

1. Are there any buildings, structures or sites located on or near the site that are over 45 years old listed in or eligible for listing in national, state or local preservation registers located on or near the site? If so, specifically describe.

No

2. Are there any landmarks, features or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

No

3. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

N/A

DW

4. Proposed measures to avoid, minimize or compensate for loss, changes to and disturbance to resources. Please include plans for the above and any permits that may be required.

None

Transportation

1. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

None

2. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

No

3. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

N/A

4. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

No

DW

5. Will the project or proposal use (or occur in the immediate vicinity of) water, rail or air transportation? If so, generally describe.

No

6. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and non-passenger vehicles). What data or transportation models were used to make these estimates?

None

7. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

No

8. Proposed measures to reduce or control transportation impacts, if any.

N/A

DW

Public Service

1. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

No

2. Proposed measures to reduce or control direct impacts on public services, if any.

N/A

Utilities

1. Check the utilities currently available at the site:
   - ☑ Electricity
   - ☑ natural gas
   - ☑ water
   - ☑ refuse service
   - ☑ telephone
   - ☑ sanitary sewer
   - ☐ septic system
   - ☐ other

2. Describe the utilities that are proposed for the project, the utility providing the service and the general construction activities on the site or in the immediate vicinity which might be needed.

None

DW

Signature

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

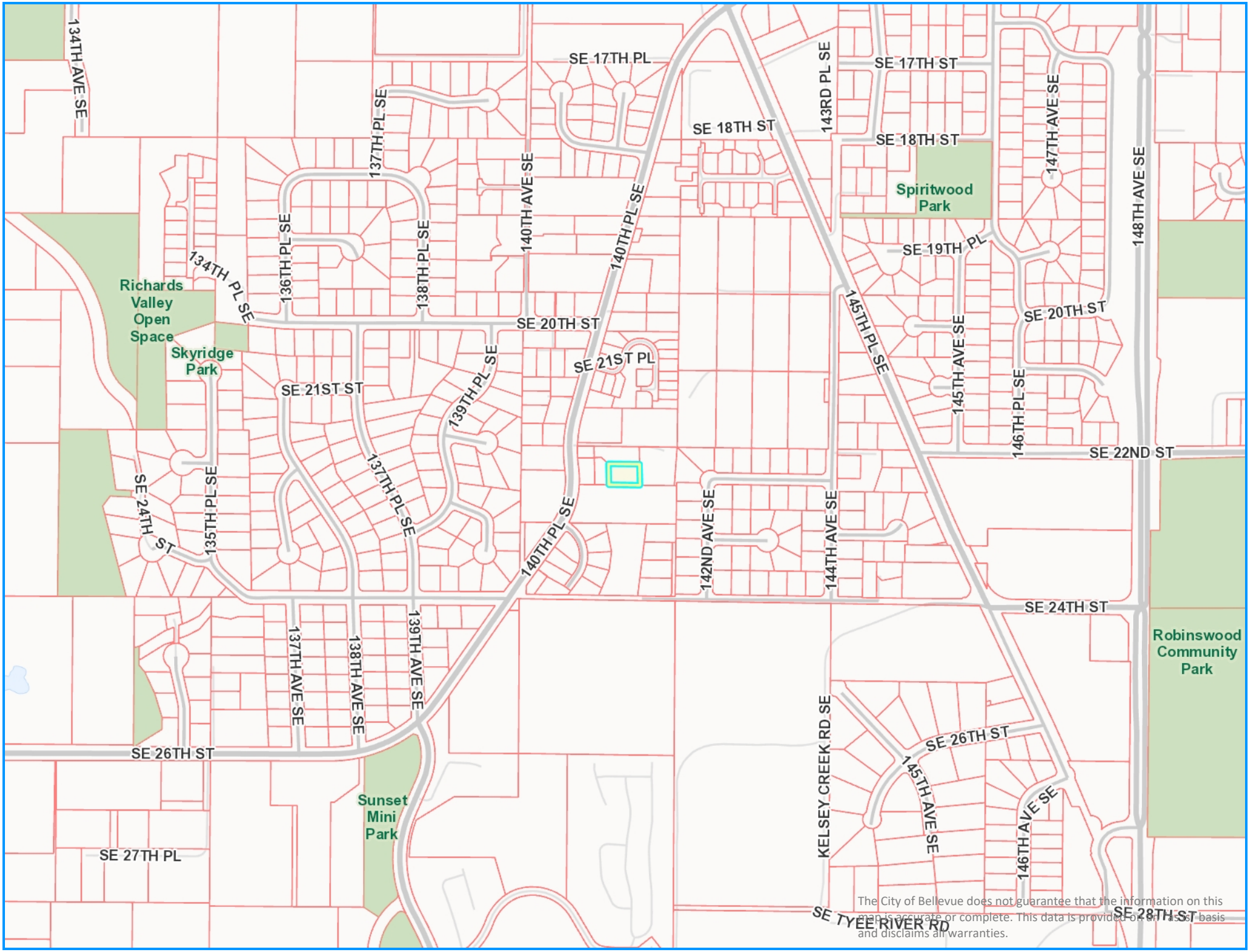
Signature Hamid Korasani

Name of signee Hamid Korasani

Position and Agency/Organization SAZEI Design Group, LLC

Date Submitted 12/1/2020

DW



TOPOGRAPHIC SURVEY

BHUPINDER SINGH BRAR
2190 140TH PLACE SE
BELLEVUE, WA 98007

SW 1/4, SE 1/4, SEC 03, TWP 24N, RNG 5E, W.M.

LEGAL DESCRIPTION

LOT 3, TOGETHER WITH AN UNDIVIDED INTEREST IN TRACT "A", CITY OF BELLEVUE SHORT PLAT NUMBER 02-143538 LF, RECORDED UNDER RECORDING NUMBER 20030620900003, RECORDS OF KING COUNTY, WASHINGTON

SITUATE IN THE CITY OF BELLEVUE, COUNTY OF KING, STATE OF WASHINGTON.

BASIS OF BEARINGS

CITY OF BELLEVUE SHORT PLAT NUMBER 02-143538 LF, RECORDED UNDER RECORDING NUMBER 20030620900003, RECORDS OF KING COUNTY, WASHINGTON

GENERAL NOTES

1. THIS SURVEY WAS COMPLETED WITHOUT BENEFIT OF A CURRENT TITLE REPORT. EASEMENTS AND OTHER ENCUMBRANCES MAY EXIST ON THIS PROPERTY THAT ARE NOT SHOWN HEREON.
2. INSTRUMENTATION FOR THIS SURVEY WAS A 3-SECOND SPECTRAPRECISION FOCUS 35 TOTAL STATION. PROCEDURES USED IN THIS SURVEY MEET OR EXCEED STANDARDS SET BY WAC 332-130-090.
3. THE INFORMATION ON THIS MAP REPRESENTS THE RESULTS OF A SURVEY MADE IN NOVEMBER 2020 AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME.
4. UTILITIES SHOWN ON THIS SURVEY ARE BASED UPON ABOVE GROUND OBSERVATIONS AND AS-BUILT PLANS WHERE AVAILABLE. ACTUAL LOCATIONS OF UNDERGROUND UTILITIES MAY VARY AND UTILITIES NOT SHOWN ON THIS SURVEY MAY EXIST ON THIS SITE.
5. ALL MONUMENTS WERE LOCATED DURING THIS SURVEY UNLESS OTHERWISE NOTED.

VERTICAL DATUM & CONTOUR INTERVAL

DATUM

ELEVATIONS SHOWN ON THIS DRAWING WERE DERIVED FROM INFORMATION PROVIDED BY WCCS SURVEY CONTROL DATABASE.

CONCRETE MONUMENT IN CASE30 FEET SOUTH OF THE INTERSECTION OF 140TH PLACE SE & 140TH WAY SE

POINT ID NO. 1134;
ELEVATION: 249.779 FEET (76.133 METERS) NAVD 88

2.0' CONTOUR INTERVAL - THE EXPECTED VERTICAL ACCURACY IS EQUAL TO 1/2 THE CONTOUR INTERVAL OR PLUS / MINUS 1.0' FOR THIS PROJECT.

PROJECT INFORMATION

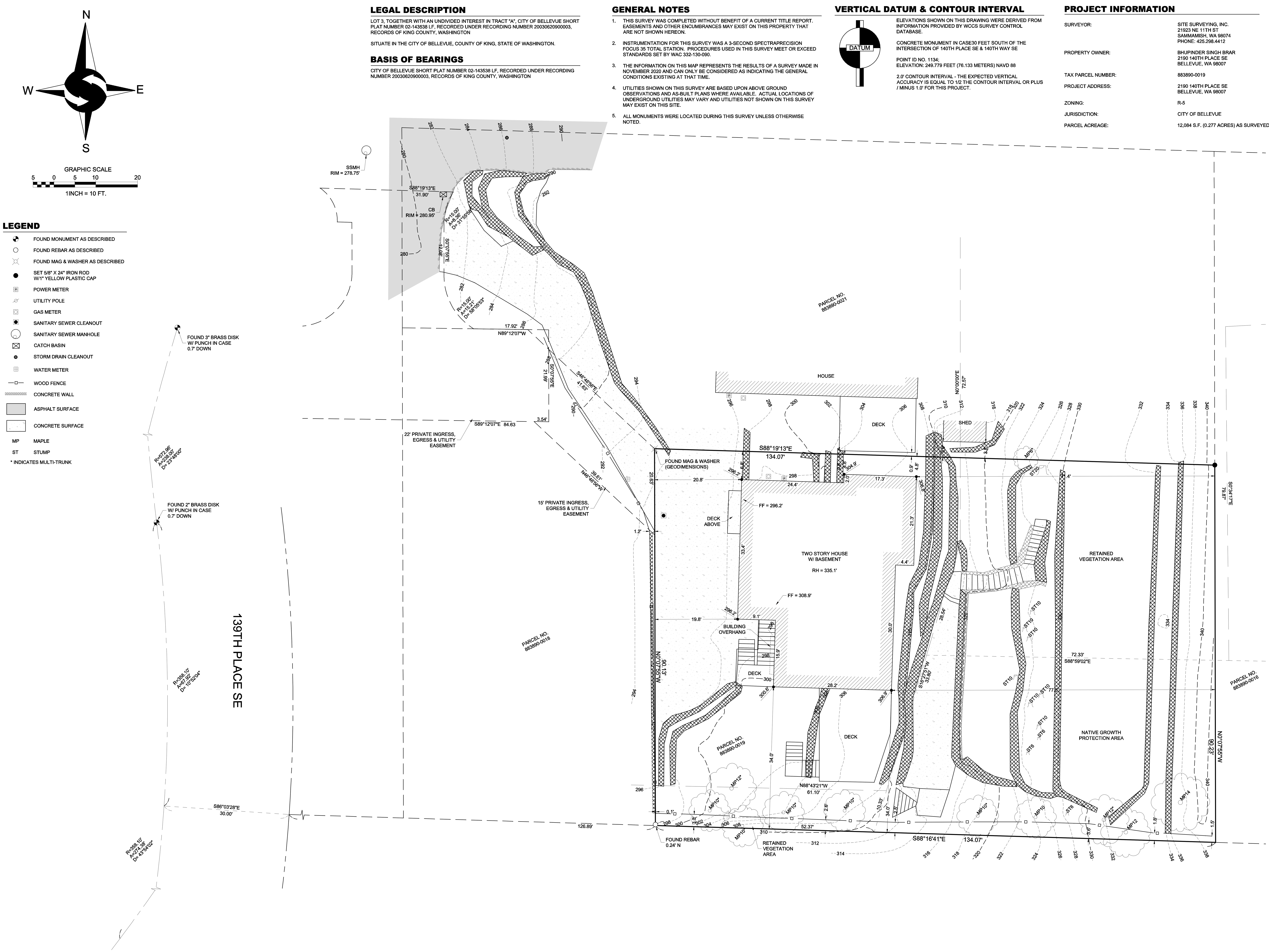
SURVEYOR:	SITE SURVEYING, INC. 21923 NE 11TH ST SAMMAMISH, WA 98074 PHONE: 425.298.4412
PROPERTY OWNER:	BHUPINDER SINGH BRAR 2190 140TH PLACE SE BELLEVUE, WA 98007
TAX PARCEL NUMBER:	883890-0019
PROJECT ADDRESS:	2190 140TH PLACE SE BELLEVUE, WA 98007
ZONING:	R-5
JURISDICTION:	CITY OF BELLEVUE
PARCEL ACREAGE:	12,084 S.F. (0.277 ACRES) AS SURVEYED

GRAPHIC SCALE
5 0 5 10 20
1INCH = 10 FT.

LEGEND

- FOUND MONUMENT AS DESCRIBED
- FOUND REBAR AS DESCRIBED
- FOUND MAG & WASHER AS DESCRIBED
- SET 5/8" X 24" IRON ROD W/1" YELLOW PLASTIC CAP
- POWER METER
- UTILITY POLE
- GAS METER
- SANITARY SEWER CLEANOUT
- SANITARY SEWER MANHOLE
- CATCH BASIN
- STORM DRAIN CLEANOUT
- WATER METER
- WOOD FENCE
- CONCRETE WALL
- ASPHALT SURFACE
- CONCRETE SURFACE
- MP MAPLE
- ST STUMP

* INDICATES MULTI-TRUNK



Site Surveying, Inc.
21923 NE 11th Street Sammamish, WA 98074
Phone: 425.298.4412
www.sitesurveymapping.com

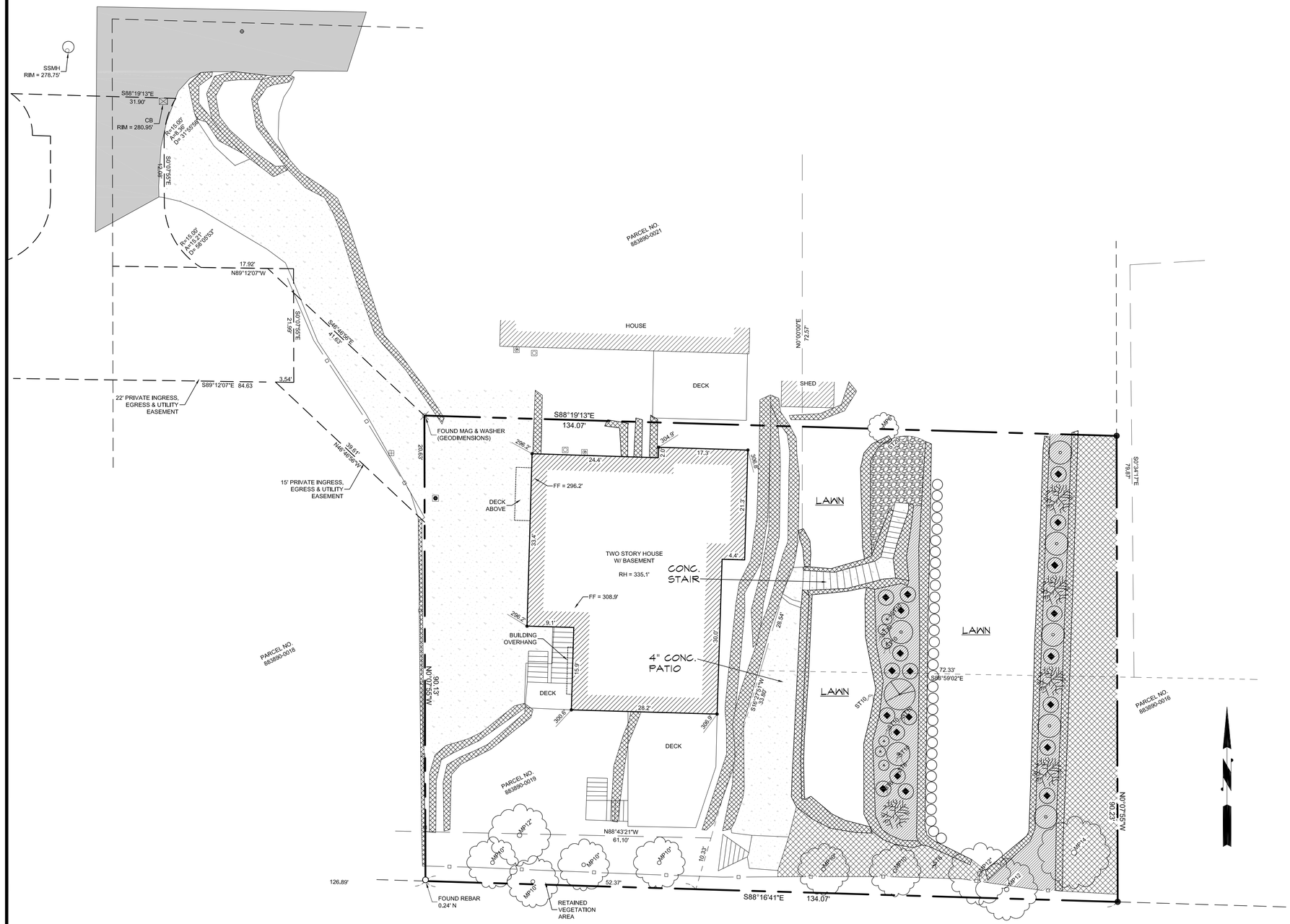
THOMAS N. WOLDENDORP, PROFESSIONAL LAND SURVEYOR, STATE OF WASHINGTON

DATE	REVISION	DRN

PROJECT NO. 20-573

DRAWN BY:	EFJ
CHECKED BY:	TNW
DATE:	11/10/2020

SHEET 1 OF 1



LANDSCAPING LEDGEND

- PINK FLOWERING DOGWOOD (CORNUS FLORIDA VAR. RUBRA)
- VINE MAPLE (ACER CIRCINATUM)
- RED-FLOWERING CURRANT (RIBES SANGUINEUM)
- JAPANESE WHITE SPIREA (SPIRAEA ALBIFLORA)
- JAPANESE BOXWOOD (BUXUS MICROPHYLLA VAR. JAPONICA) HEDGE
- SWORD FERN (POLYSTICHUM MUNITUM)
- KINNIKINNICK
- BLUE RUG JUNIPER (JUNIPERUS HORIZONTALIS 'WILTONII') GROUND COVER SPACE PLANTS 4-6 FEET APART
- MULCH (2" DEEP)
- GRAVEL

LANDSCAPING PLAN

SCALE : 1" = 10'-0"

0 10 20 40

SAZEI DESIGN GROUP, LLC
6608 110TH AVE. N.E.
KIRKLAND, WA. 98033
TEL. (425) 214-2280
FAX. (425) 889-6887

LANDSCAPING PLAN

BRAR / KAUR RESIDENCE
FILE NO. 19-110047-EA
2190 140TH PLACE SE, BELLEVUE, WA 98007

Revisions
1 –
2 –
3 –
4 –
5 –

Drawn	Checked
DSF	

Date: NOVEMBER 24,2020

Sheet: L1

Scale	Job
1/8"=1'-0"	

GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists & Environmental Specialists

November 30, 2020 G-5288

Bhupinder Brar
2190 140th Place SE
Bellevue, Washington 98007
Email: nyc_vick@yahoo.com
cc: hamidkorasani@yahoo.com

Subject: Geotechnical Engineering Study
Proposed Retaining Walls
2190 140th Place SE
Bellevue, Washington 98007

Dear Mr. Brar,

GEO Group Northwest, Inc. has completed a geotechnical engineering study of the above-subject property for the proposed retaining walls in Bellevue, Washington.

SITE DESCRIPTION

The project site is located in the Robinswood neighborhood in Bellevue, Washington, as illustrated in Plate 1 – Site Location Map. The above-subject property comprises King County Parcel No. 883890-0019 and is approximately 12,060 square feet in size and rectangular in shape. The east half of the property was developed in 2007 to include a three-story, single-family residence that was built into the bottom of the property's west-facing slope. The residence contains a garage attached to the finished basement level, and 3,600 square feet of interior living space. According to the City of Bellevue Critical Hazards Map, the east half of the property contains a 25-foot steep slope area, and the entire property is located within the southeastern corner of a severe soil erosion hazard area which extends towards the Kelsey Creek Park area.

The original development of the property included the construction of Keystone block retaining walls parallel to the residence's east exterior walls. This section of block retaining walls includes two terraced walls with a combined height of approximately 8 feet. These walls previously retained the property's existing steep slope area with a height of about 25-feet extending from the block walls to the east property line. The existing site conditions of the property are illustrated in Plate 2 – Site Plan.

PROPOSED RETAINING WALLS

Based on the information provided, we understand that the homeowner has constructed a series of terraced block retaining walls as well as a concrete retaining wall into the eastern steep slope area of the property without a permit from the City of Bellevue. A 4-inch thick concrete patio was also added at the top of the original Keystone block retaining walls, which is the bottom elevation of the newly constructed block retaining walls. The lower block retaining wall has a height of 4 feet, and an additional 4-foot concrete retaining wall was constructed adjacent to the top of this block wall. We understand that this concrete retaining wall was not constructed with a footing to provide lateral resistance and that the wall is proposed to be reinforced with counterforts or buttresses.

Four other block retaining walls were constructed into the slope and their heights, from lowest elevation to highest, are 2.5 feet, 3.5 feet, 1.7 feet, and 3.5 feet. The topography between all of the newly constructed retaining walls is relatively flat, and the horizontal distance between each terraced wall is greater than its adjacent upper wall height, which suggests that the walls are not creating significant surcharge loads on the lower adjacent walls. Approximately 10 deciduous trees were removed from the slope between the walls with heights of 2.5 feet and 3.5 feet, and this area currently contains a grassy lawn area and the tree stumps. The locations of the new concrete retaining walls are shown in Plate 2 – Site Plan, and a cross section of the existing slope conditions are shown in Plate 3 – Existing Slope Cross Section.

GEOLOGIC OVERVIEW

According to published geologic mapping of the area, the site soils are identified as Advance Outwash (Qv_a). Advance Outwash deposits from the Pleistocene Era typically consist of well-bedded, medium- and fine-grained sands that were deposited in outwash channels created from the terminus of the glacier as it advanced southward into the Puget Sound area approximately

15,000 years ago. These deposits were overridden by the advancing ice and are dense to very dense as a result

SUBSURFACE INVESTIGATION

On November 20, 2020, Mr. Bryce Frisher, Staff Geotechnical Engineer from our firm, visited the site to perform a visual reconnaissance of the property and investigate the subsurface soil conditions. We drilled two exploratory soil borings (HA-1 and HA-2) using a hand auger during our site visit. Boring HA-1 was drilled in the upper east lawn area between the two highest block retaining walls, and Boring HA-2 was drilled parallel to the concrete retaining wall near the south property line. The locations of the borings are shown in Plate 2 – Site Plan. Logs of the conditions encountered in the borings are provided in Attachment 1 to this report.

Soils encountered in HA-1 and HA-2 consisted of a surficial layer of grass and grayish brown, fine-grained sand underlain with brown, loose fine-grained sand with gravel up to a depth of about 2 feet below the ground surface. Soils below 2 feet consisted of brown, loose to medium dense fine-grained sand with some gravel and increasing density and decreasing gravel content with depth. Soils below 3 feet consisted of medium dense, damp, sand which remained consistent up to the termination of the borings at depths of 5 feet for HA-1 and 3 feet for HA-2, where refusal was encountered. We did not encounter water seepage in either of the two borings.

Based on the results of our subsurface investigation, it is our opinion that the property is underlain with dense, sandy Advance Outwash (Q_{va}) deposits, which is consistent with the geologic mapping of the project site.

SITE RECONAISSANCE

On November 20, 2020, William Chang and Bryce Frisher, principal engineer and staff geotechnical engineer from our office, conducted a site visit to observe the existing conditions of the new concrete and block retaining walls at the project site. We observed that the block retaining walls is consistent with our typical recommendations for block wall construction, which includes a minimum of one base block embedded into the soil for each wall and the horizontal distance surpassing the height of adjacent terraced walls. In our opinion, the block walls are stable in their existing conditions and do not need to be removed. During our site reconnaissance, we observed the condition of the 4-foot concrete retaining wall and observed

that it was vertical and did not contain exposed cracks. In our opinion, the concrete retaining wall can be reinforced with the addition of a base slab and counterfort walls to provide enhanced lateral resistance without the need for removal. Our recommendations for the counterfort wall are outlined in a later section of this report.

After our reconnaissance, we conducted a stability analysis of two of the new block walls to ensure that they are stable in their existing conditions. The stability analysis was conducted on the 3.5-foot block wall east of the removed tree stumps, and the 3.5-foot block wall closest to the east property line. The analysis confirms that the two 3.5-foot block retaining walls are stable in their existing conditions in terms of the calculated factors of safety surpassing the minimum values of 1.5 for the static case and 1.1 for the seismic case. The detailed results of our analysis of the bock walls is given in Attachment 2 – Lower East Wall Analysis and Attachment 3 – Upper East Wall Analysis.

Based on the results of our site reconnaissance and the wall stability analysis, is it our opinion that the constructed block walls are stable in their existing condition and they will not significantly impact the steep slope and soil erosion hazards mapped at the site.

CRITICAL AREAS REVIEW

We understand that the eastern portion of the property where the block retaining walls were constructed contains a steep slope critical area as well as a native growth protection area. The above-subject property is entirely located within a severe soil erosion hazard area as well. Based on the results of our subsurface investigation, the project site is underlain with dense, damp, fine-grained native soils consistent with the Advance Outwash (Q_{va}) deposits shown on the geologic mapping of the area. We encountered these dense soils at depths between 2 and 3 feet below the ground surface at different elevations of the eastern portion of the property. In our opinion, the risk of deep-seated soil erosion at the project site due to the construction of the new retaining walls is minimal due to the presence of dense soils at relatively shallow depths.

Based on the existing site conditions at the above-subject property, the existing steep slope at the east half of the property has a west-facing inclination of approximately 25 feet from the east property line to the top of the Keystone block walls constructed in 2007. The new block walls were constructed along the site's natural topography to minimize the risk of soil erosion and to

maintain the existing slope stability at the property. In our opinion, the placement of the block retaining walls will not reduce the existing stability at the site, and the risks associated with the critical areas can be mitigated with the addition of the counterfort concrete wall attached to the 4-foot concrete retaining wall. Based on the site conditions observed and the results of our subsurface investigation, we do not recommend the complete removal of the block walls and restoration to the previous site conditions.

Mitigation Recommendations

We recommend mitigating the stability risk associated with the concrete retaining wall by tying it into a reinforced concrete counterfort wall, as shown in the structural drawings. Handrails should be added to the top of the concrete retaining wall and along the edges of the concrete steps to ensure that safety of the permanent condition of the proposed work is code compliant. Soil erosion can be mitigated by adding landscaping and native plants (such as kinnikinick and dogwood) to the areas where the deciduous trees were previously removed.

CONCLUSIONS AND RECOMMENDATIONS

It is our opinion that the proposed retaining walls will not increase the risk of soil instability at the site or on adjacent properties if the recommendations provided below are properly implemented. To this end, we recommend that the existing block wall backfill be excavated for the installation of the concrete counterfort wall to minimize the soil erosion hazard and slope instability risks at the project site. Details of these recommendations and other recommendations regarding geotechnical aspects of the project are presented in the following sections of this report.

Grading and Earthwork

Site Clearing and Erosion Control

Grading work for the proposed counterfort walls should be restricted to the minimum needed to achieve proposed final grades. The area where construction work will be performed should be cleared of vegetation, topsoil, organics, debris, and any other deleterious materials that are found. These materials should be hauled off site or used for landscaping, as appropriate; they should not be used as structural fill or retaining wall backfill for the project.

Temporary erosion and sedimentation controls (TESCs) should be installed as part of site clearing activities. TESCs for the project can include using silt fences, check dams, straw mulch, hay bales, and a stabilized construction entrance. The silt fences or other barrier controls should be placed along the cross-slope and down-slope boundaries of the disturbed areas to prevent sediment-laden runoff from being discharged off site or towards the residence. Exposed soils, including stockpiled soils, should be covered with plastic sheeting when they are not being worked.

Excavations

Temporary excavation slopes should not be greater than the limits specified in local, state and federal government safety regulations. Temporary excavations for the counterfort walls into dense native soils can be sloped to inclinations up to near-vertical, if completed under the observation of the geotechnical engineer.

During construction, water should not be allowed to stand in areas where the counterfort wall will be constructed. Surface runoff should not be allowed to flow over the top of slopes into excavations. During wet weather, exposed slopes should be covered with plastic sheeting to prevent erosion or softening.

Counterfort Concrete Retaining Wall

We understand that concrete counterfort walls are proposed to be tied into the existing 4-foot concrete retaining wall. Counterfort walls are buttresses attached to the inside face of a retaining wall to provide additional resistance to lateral forces. The counterforts will be installed to tie the existing wall with the slab foundation to reduce the shear forces and bending moment imposed on the existing wall by the retained soils. Concrete retaining walls which are free to rotate on top (unrestrained) are considered capable of yielding and should be designed using an active earth pressure. Our recommended soil engineering parameters for retaining wall design are as follows:

Active Earth Pressure

- 35 pcf equivalent fluid pressure for level ground behind the walls;

Passive Earth Pressure

- 350 pcf equivalent fluid pressure for compacted structural fill and native undisturbed soil

Base Coefficient of Friction

- 0.35 for undisturbed competent native soil or compacted structural fill

Surcharge loads imposed on walls due to upward sloping ground, or other conditions that could impose loads against the walls, should be added to the active earth pressure stated above. Also, downward sloping ground in proximity to the wall should be evaluated, as it may have the effect of reducing the value of the allowable passive earth pressure stated above.

Surface Drainage

We recommend that storm water drainage from impervious areas be collected into an infiltration pit proposed to be constructed south of the residence's driveway and at the bottom of the property's west facing slope area. Storm water should not be permitted to develop into concentrated flows on the ground surface, because concentrated flows can lead to increased soil erosion and rutting. Final site grades should direct surface water away from the retaining walls and the residence.

LIMITATIONS

Our findings and recommendations stated herein are based on field observations, our experience with similar projects, and our professional judgment. The recommendations presented in this letter are our professional opinion derived in a manner consistent with the level of care and skill ordinarily exercised by other members of the profession currently practicing under similar conditions in this area and within the project schedule and budget constraints. No warranty is expressed or implied. In the event that soil conditions are found to differ from those discussed in this report, GEO Group Northwest should be notified and the relevant recommendations in this report should be re-evaluated.

CLOSING

We appreciate the opportunity to provide you with geotechnical engineering services for this project. Please do not hesitate to contact us if you have any questions regarding this report.

Sincerely,

GEO Group Northwest, Inc.

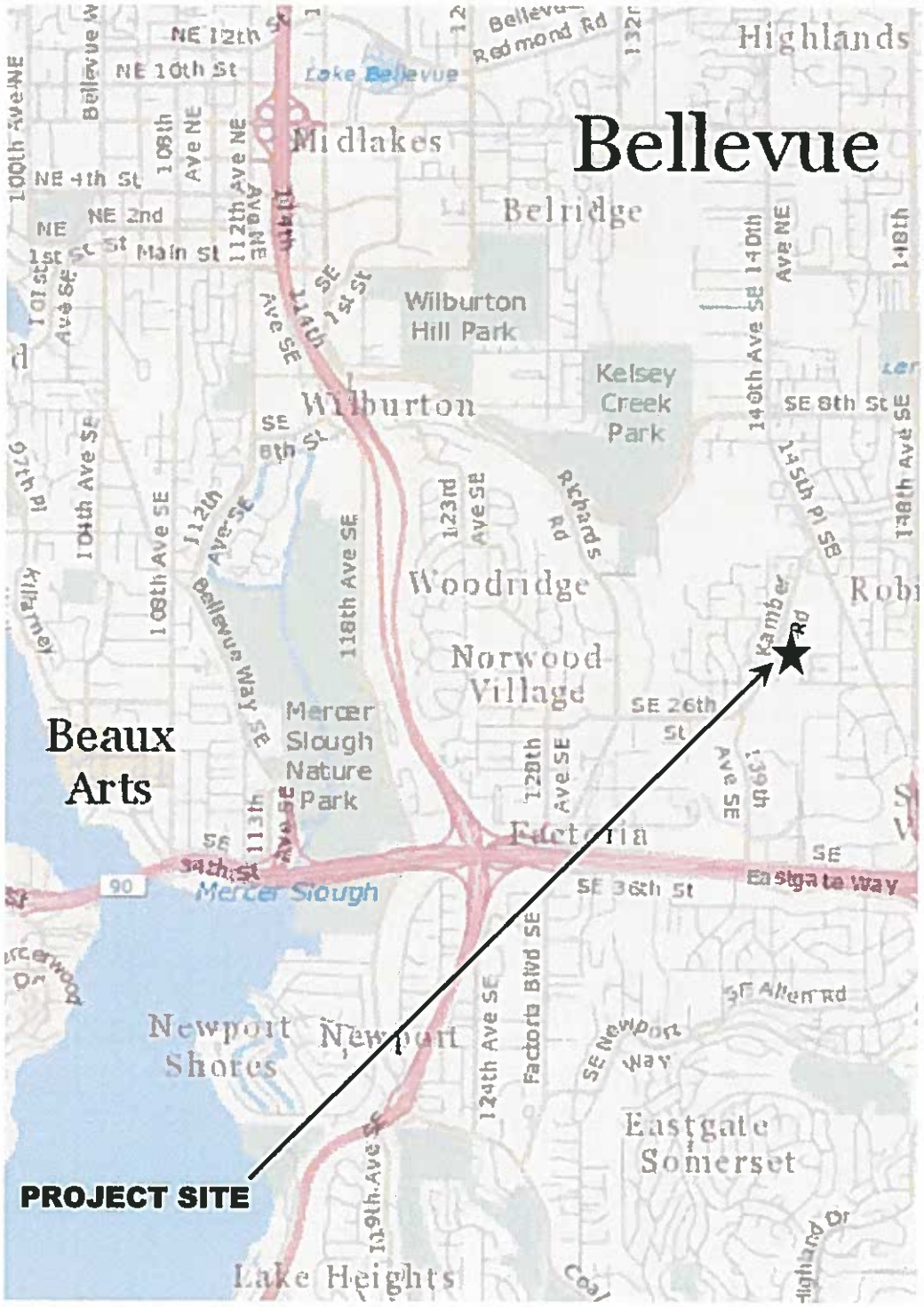
Bryce Frisher, E.I.T.
Staff Geotechnical Engineer

William Chang, P.E.
Principal Engineer

Plates and Attachment:

Plate 1 – Site Location Map
Plate 2 – Site Plan
Plate 3 – Existing Slope Cross Section

Attachment 1 – Boring Logs
Attachment 2 – Lower East Wall Analysis
Attachment 3 – Upper East Wall Analysis



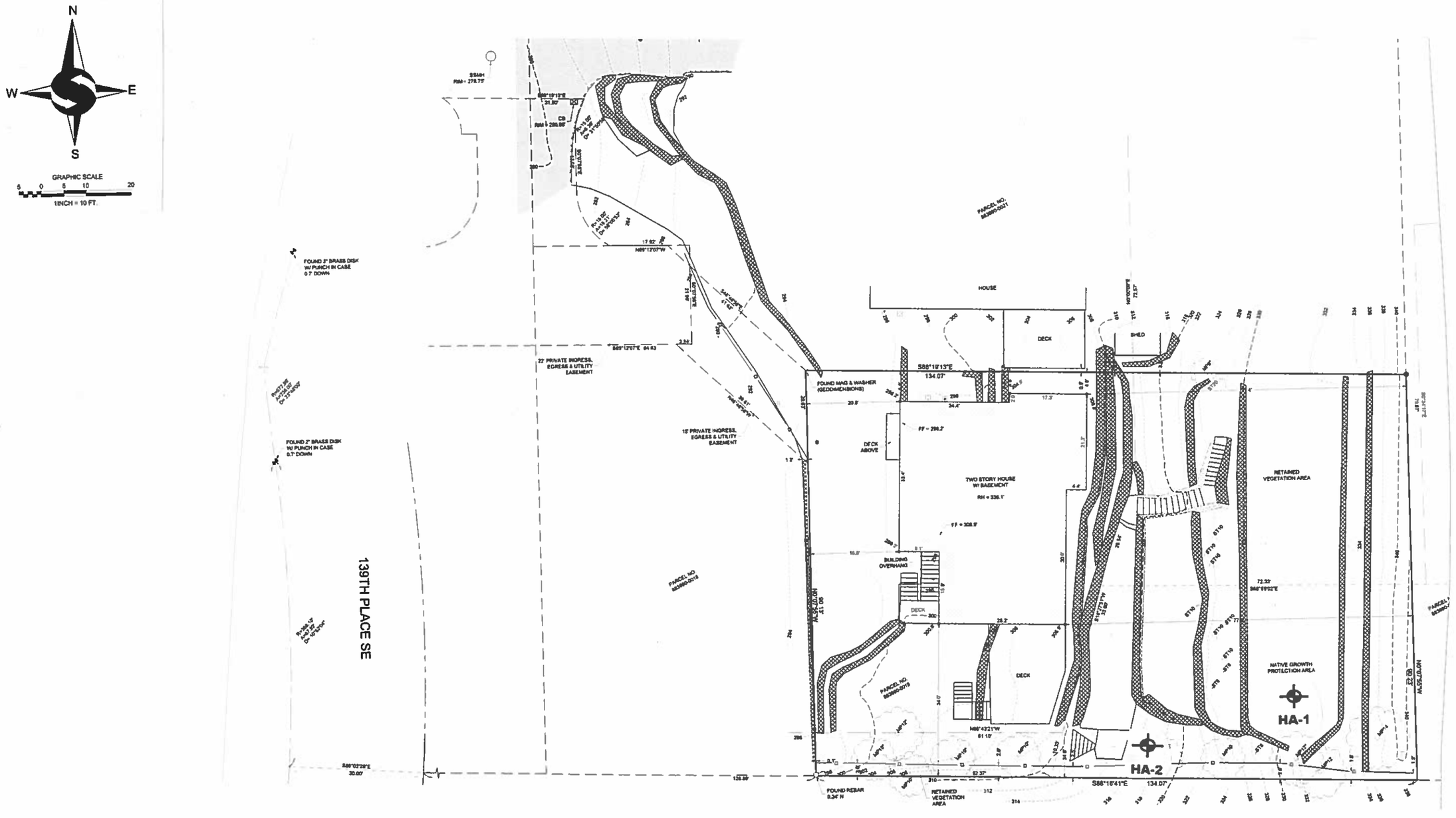
Source: King County GIS, 2017.

GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists, & Environmental Scientists

SITE LOCATION MAP

PROPOSED RETAINING WALLS
2190 140TH PLACE SE
BELLEVUE, WASHINGTON

SCALE:	NO SCALE	DATE:	11/23/2020	MADE:	BF	CHKD:	WC	JOB NO:	G-5288	PLATE	1



LEGEND

HA-1 — EXPLORATORY SOIL BORING LOCATION

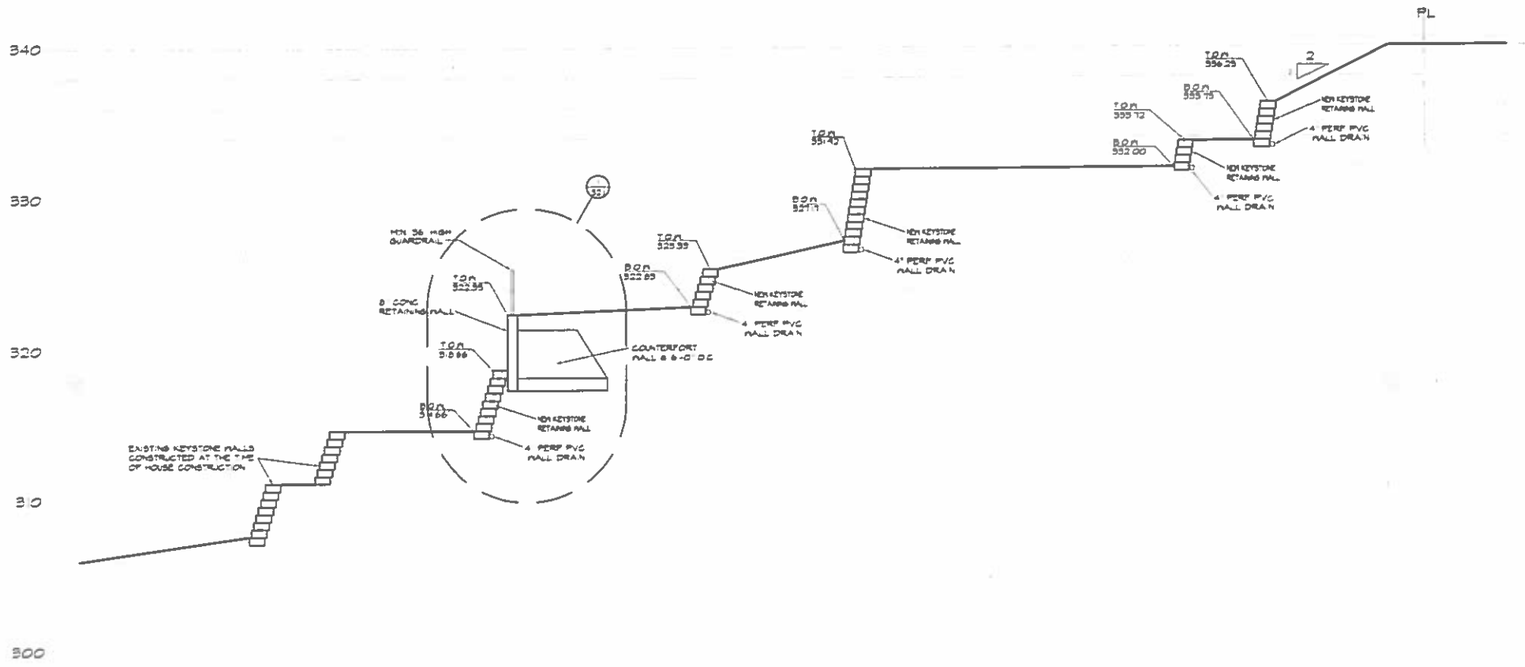
Source: Topographic Survey by Site Surveying, Inc., Dated 11/20/2020.

GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists, & Environmental Scientists

SITE PLAN

PROPOSED RETAINING WALLS
2190 140TH PLACE SE
BELLEVUE, WASHINGTON

SCALE	AS SHOWN	DRAWN BY	BF	CHECKED BY	WC	DATE	11/30/2020	PROJECT NO.	G-5288	PLATE	2



Source: Section, Brar / Kaur Residence by Sazei Design Group, LLC, Dated 11/24/2020.

GEO Group Northwest, Inc.
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EXISTING SLOPE CROSS SECTION

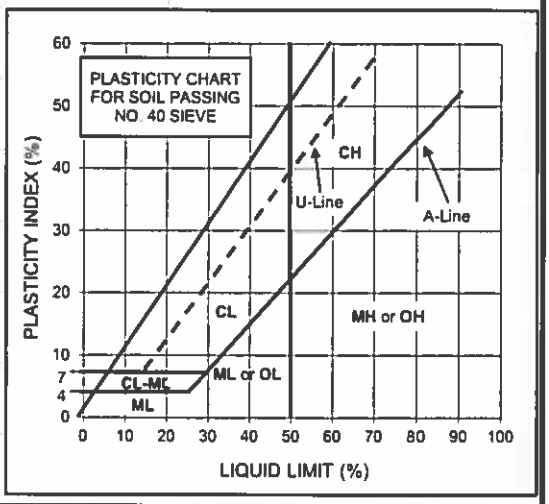
PROPOSED RETAINING WALLS
2190 140TH PLACE SE
BELLEVUE, WASHINGTON

SCALE	1" = 10'	DRAWN BY	BF	CHECKED BY	WC	DATE	11/30/2020	PROJECT NO.	G-5288	PLATE	3

SOIL CLASSIFICATION & PENETRATION TEST DATA EXPLANATION

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

MAJOR DIVISION			GROUP SYMBOL	TYPICAL DESCRIPTION	LABORATORY CLASSIFICATION CRITERIA	
COARSE-GRAINED SOILS	GRAVELS (More Than Half Coarse Fraction is Larger Than No. 4 Sieve)	CLEAN GRAVELS (little or no fines)	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURE, LITTLE OR NO FINES	CONTENT OF FINES BELOW 5%	Cu = (D60 / D10) greater than 4 Cc = $(D30)^2$ / (D10 * D60) between 1 and 3
			GP	POORLY GRADED GRAVELS, AND GRAVEL-SAND MIXTURES LITTLE OR NO FINES		CLEAN GRAVELS NOT MEETING ABOVE REQUIREMENTS
		DIRTY GRAVELS (with some fines)	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES	CONTENT OF FINES EXCEEDS 12%	GM: ATTERBERG LIMITS BELOW "A" LINE or P.I. LESS THAN 4
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES		GC: ATTERBERG LIMITS ABOVE "A" LINE or P.I. MORE THAN 7
More Than Half by Weight Larger Than No. 200 Sieve	SANDS (More Than Half Coarse Fraction is Smaller Than No. 4 Sieve)	CLEAN SANDS (little or no fines)	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	CONTENT OF FINES BELOW 5%	Cu = (D60 / D10) greater than 6 Cc = $(D30)^2$ / (D10 * D60) between 1 and 3
			SP	POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES		CLEAN SANDS NOT MEETING ABOVE REQUIREMENTS
		DIRTY SANDS (with some fines)	SM	SILTY SANDS, SAND-SILT MIXTURES	CONTENT OF FINES EXCEEDS 12%	ATTERBERG LIMITS BELOW "A" LINE with P.I. LESS THAN 4
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES		ATTERBERG LIMITS ABOVE "A" LINE with P.I. MORE THAN 7
FINE-GRAINED SOILS	SILTS (Below A-Line on Plasticity Chart, Negligible Organics)	Liquid Limit < 50%	ML	INORGANIC SILTS, ROCK FLOUR, SANDY SILTS OF SLIGHT PLASTICITY		
		Liquid Limit > 50%	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOIL		
	CLAYS (Above A-Line on Plasticity Chart, Negligible Organics)	Liquid Limit < 50%	CL	INORGANIC CLAYS OF LOW PLASTICITY, GRAVELLY, SANDY, OR SILTY CLAYS, CLEAN CLAYS		
		Liquid Limit > 50%	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS		
Less Than Half by Weight Larger Than No. 200 Sieve	ORGANIC SILTS & CLAYS (Below A-Line on Plasticity Chart)	Liquid Limit < 50%	OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY		
		Liquid Limit > 50%	OH	ORGANIC CLAYS OF HIGH PLASTICITY		
HIGHLY ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS		



SOIL PARTICLE SIZE

FRACTION	U.S. STANDARD SIEVE Passing Sieve	Passing Size (mm)	Retained Sieve	Retained Size (mm)
SILT / CLAY	#200	0.075		
SAND				
FINE	#40	0.425	#200	0.075
MEDIUM	#10	2.00	#40	0.425
COARSE	#4	4.75	#10	2.00
GRAVEL				
FINE	0.75"	19	#4	4.75
COARSE	3"	76	0.75"	19
COBBLES	76 mm to 203 mm			
BOULDERS	> 203 mm			
ROCK FRAGMENTS	> 76 mm			
ROCK	>0.76 cubic meter in volume			

GENERAL GUIDANCE FOR ENGINEERING PROPERTIES OF SOILS, BASED ON STANDARD PENETRATION TEST (SPT) DATA

SANDY SOILS				SILTY & CLAYEY SOILS		
Blow Counts N	Relative Density, %	Friction Angle ϕ, degrees	Description	Blow Counts N	Unconfined Strength Qu, tsf	Description
0 - 4	0 - 15		Very Loose	< 2	< 0.25	Very soft
4 - 10	15 - 35	26 - 30	Loose	2 - 4	0.25 - 0.50	Soft
10 - 30	35 - 65	28 - 35	Medium Dense	4 - 8	0.50 - 1.00	Medium Stiff
30 - 50	65 - 85	35 - 42	Dense	8 - 15	1.00 - 2.00	Stiff
> 50	85 - 100	38 - 46	Very Dense	15 - 30	2.00 - 4.00	Very Stiff
				> 30	> 4.00	Hard

GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists, & Environmental Scientists
13240 NE 20th Street, Suite 10, Bellevue, WA 98005
Phone (425) 649-8757 Fax (425) 649-8758

PLATE A1

BORING NO. HA-1

Completed By: BF | Date Drilled: 11/23/2020 | Surface Elev. 330'

Depth ft.	Elevation	USCS Code	Description	Sample Loc.	Sample No.	Probing Rod Penet. (in.)	Water Content %	Other Tests/ Comments
		SM	SILTY SAND, brown, moist, loose, fine-grained.			47"		
1		SP	SAND, brown, fine-grained, damp, loose, some GRAVEL.			38"	10.2	
2		SP	SAND, loose, fine-grained, brown to light brown, damp, rare GRAVEL, some thin roots.			31"	9.2	
3		SP	SAND, loose, brown, thin roots, damp to moist, fine-grained.			13"	11.2	
4		SP	SAND, brown to light brown, medium dense, fine-grained, moist, some GRAVEL.			2"	14.9	
5		SP	SAND, dense, light brown, fine-grained, rare GRAVEL, damp to moist.			< 1"	10.2	
6			Depth of boring: 4.8 feet. Refusal. Drilling Method: Hand Auger Sampling Method: Grab and hand tools. Water seepage encountered at 2.5 feet.					

LEGEND: 2" O.D. SPT Sampler; 3" O.D. California Sampler; ▽ Water Level noted during drilling; ▼ Water Level measured at later time, as noted

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Geotechnical Engineers, Geologists, & Environmental Scientists

BORING LOG

PROPOSED RETAINING WALLS
2190 140TH PLACE SE
BELLEVUE, WASHINGTON

JOB NO. G-5288 | DATE 11/24/2020 | PLATE A2

BORING NO. HA-2

Completed By: BF Date Drilled: 11/23/2020 Surface Elev. 320'

Depth ft.	Elevation	USCS Code	Description	Sample Loc.	Sample No.	Probing Rod Penet. (in.)	Water Content %	Other Tests/ Comments
1		SM	SILTY SAND, brown, moist, loose, fine-grained, mulch and thin roots.			32"		
		SP - SM	SAND with SILT, loose, brown, fine-grained, moist, some thin roots, silty fines, rare GRAVEL.			13"	13.7	
2		SP	SAND, loose, brown to light brown, fine-grained with some medium-grained SAND, rare GRAVEL, moist.			10"	12.6	
		SP	SAND, fine-grained, medium dense to dense, light brown, rare GRAVEL, damp.			1"	8.9	
3		SP	SAND, dense, fine-grained, damp, rare GRAVEL, light brown.			< 1"	7.7	
			Depth of boring: 3.2 feet. Refusal. Drilling Method: Hand Auger Sampling Method: Grab and hand tools. Groundwater not encountered.					
4								
5								

LEGEND: 2" O.D. SPT Sampler; 3" O.D. California Sampler; Water Level noted during drilling; Water Level measured at later time, as noted

GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists, & Environmental Scientists

BORING LOG

PROPOSED RETAINING WALLS
2190 140TH PLACE SE
BELLEVUE, WASHINGTON

JOB NO. G-5288 **DATE** 11/24/2020 **PLATE** A3

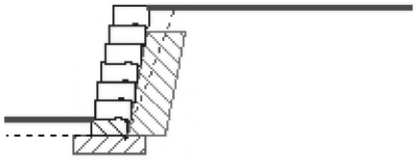
Project: G-5288 - Brar Residence

Site: 2190 140th Place SE, Bellevue, WA

Date: 11/30/2020

Section Summary Report

Section	lower east
Report Date	November 30, 2020
Designer	KJ
Design Standard	Rankine Theory Analysis
Design	Static and Seismic
Unit of Measure	U.S./Imperial
Selected Facing Unit	Product Line: Keystone Lip/Lug Systems Name: Regal Stone
Seismic As 0.15	Default Deflection of 2.00 inch



Soil Parameters

Soil Zone	Phi Angle [degrees]	Cohesion [lb/ft²]	Unit Weight [lb/ft³]	Friction Factor	Description
Retained	36	0.00	125.00	n/a	
Foundation	36	0.00	125.00	n/a	
Leveling Pad	40	n/a	n/a	0.70	
Drainage	40	n/a	130	n/a	

Section Details

Section Height	3.50	Back Slope	0.00°	LL Surcharge	0	DL Surcharge	0
Design Height	3.50 ft	Crest Offset	0.00 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	0.50 ft	Wall Batter	10.60°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Conventional

External		Value	Internal		Value	Facing	Value
FSsl	Base Sliding	1.50	FSsl	Internal Sliding	1.50		
FSbc	Bearing Capacity	2.00	FSsc	Shear Capacity	1.50		
FSot	Overturning	1.50					

Seismic

Conventional

External		Value	Internal		Value	Facing	Value
FSsl	Base Sliding	1.10	FSsl	Internal Sliding	1.10		
FSbc	Bearing Capacity	1.10	FSsc	Shear Capacity	1.10		
FSot	Overturning	1.10					

Analysis Results

*** Embedment is included in Bearing Capacity**

External Static	FS			
Bearing Capacity	19.68	Bearing Pressure	340.52	lb/ft²
Overturning	1.89	Max Eccentricity	0.13	ft
Base Sliding	1.66			

External Seismic	FS			
Bearing Capacity	27.53	Bearing Pressure	243.36	lb/ft²
Overturning	1.17	Max Eccentricity	-0.11	ft
Base Sliding	1.18			

Internal Static Course	Elevation [ft]	Shear Capacity FS
1	0.50	11.57
2	1.00	15.36
3	1.50	21.54
4	2.00	32.76
5	2.50	56.65
6	3.00	123.88
7	3.50	

Internal Seismic Course	Elevation [ft]	Shear Capacity FS
1	0.50	8.22
2	1.00	10.56

Internal Seismic Course	Elevation [ft]	Shear Capacity FS
3	1.50	14.18
4	2.00	20.29
5	2.50	31.91
6	3.00	59.11
7	3.50	

Project: G-5288 - Brar Residence

Site: 2190 140th Place SE, Bellevue, WA

Date: 11/30/2020

Wall: lower east wall

Project Information

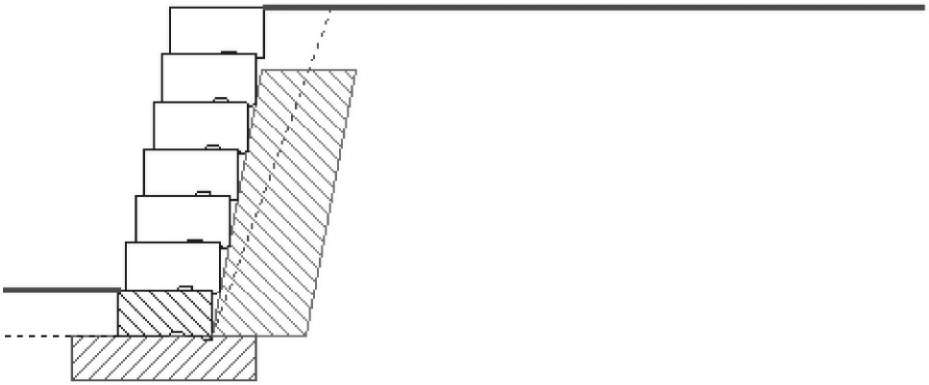
Client	GEO Group Northwest, Inc.				
Name	Brar Residence			**Number**	G-5288
Site	2190 140th Place SE, Bellevue, WA			**Designer**	KJ
Revision	1	**Created**	11/16/2020	**Modified**	11/30/2020
Standard	Rankine Theory Analysis				
Seismic As	0.15	Default Deflection of 2.00 inch			
Comments					

Selected Facing Unit

Product Line: Keystone Lip/Lug Systems
Name: Regal Stone

Project Summary

Tallest Section



Project Design Inputs

Design Standard Rankine Theory Analysis

Minimum Factors of Safety

Conventional

External		Value	Internal		Value	Facing		Value
FSsl	Base Sliding	1.50	FSsl	Internal Sliding	1.50			
FSbc	Bearing Capacity	2.00	FSsc	Shear Capacity	1.50			
FSot	Overturning	1.50						

Reinforced

External		Value	Internal		Value	Facing		Value
FSsl	Base Sliding	1.50	FSsl	Internal Sliding	1.50	FScs	Connection Strength	1.50
FSbc	Bearing Capacity	2.00	FSpo	Pullout	1.50	FSsc	Facing Shear	1.50
FSct	Crest Toppling	1.50	FSto	Tensile Overstress	1.50			
FSot	Overturning	2.00						

Seismic

Conventional

External		Value	Internal		Value	Facing		Value
FSsl	Base Sliding	1.10	FSsl	Internal Sliding	1.10			
FSbc	Bearing Capacity	1.10	FSsc	Shear Capacity	1.10			
FSot	Overturning	1.10						

Reinforced

External		Value	Internal		Value	Facing		Value
FSsl	Base Sliding	1.20	FSsl	Internal Sliding	1.20	FScs	Connection Strength	1.20
FSbc	Bearing Capacity	1.50	FSpo	Pullout	1.20	FSsc	Facing Shear	1.20
FSct	Crest Toppling	1.20	FSto	Tensile Overstress	1.20			
FSot	Overturning	1.50						

Design Factors

Term	Description	Minimum (as appl.)	Maximum (as appl.)
RC	Reinforced coverage ratio	1.00	0.00

Selected Facing Unit

Product Line: Keystone Lip/Lug Systems
Name: Regal Stone

Facing Height	Hu	0.50 ft
Facing Width	Lu	1.29 ft
Facing Depth	Wu	1.00 ft
Facing Weight	Xu	120 lb/ft³
Center of Gravity	Gu	0.50 ft
Setback	Δu	0.09 ft
Batter	ω	10.60 °
Cap Height	Hcu	0.00 ft
Initial Shear Capacity	au	1420.00 lb/ft
Apparent Shear Angle	λu	36.00 °
Maximum Shear Capacity	Vu(max)	4036.00 lb/ft

Selected Soil Types

Soil Zone	Phi Angle [degrees]	Cohesion [lb/ft²]	Unit Weight [lb/ft³]	Description
Reinforced	36	n/a	125.00	
Retained	36	0.00	125.00	
Foundation	36	0.00	125.00	
Leveling Pad	40	n/a	n/a	
Drainage	40	n/a	0.70	

Soil Glossary

CH:	Inorganic clays, high plasticity
CL:	Inorganic clays, low to medium plasticity, gravelly, sandy, silty, lean clays
GC:	Clayey gravels, poorly graded gravel-sand-clay mixtures
GM:	Silty gravels, poorly graded gravel-sand-silt mixtures
GP:	1/2"-3/4" clean crushed stone or crushed gravel
GW:	Well-graded gravels, gravel-sand. Little or no fines.
MH:	Inorganic clayey silts, elastic silts
ML:	Inorganic silts, very fine sands, silty or clayey, slight plasticty
SC:	Clayey sands, poorly graded sand-clay mixtures
SM:	Silty sands, poorly graded sand-silt mixtures
SP:	Poorly-graded sands, gravelly sands. Little or no fines.
SW:	Well-graded sands, gravelly sands. Little or no fines.

Analysis Summary

Lowest Values - Conventional

Static Analysis

Test	Description	Section	Course	Minimum Requirement	Result	Status
FSsl	Base Sliding	1		1.50	1.66	Pass
FSbc	Bearing Capacity	1		2.00	19.68	Pass
FSot	Overturning	1		1.50	1.89	Pass
FSsc	Shear Capacity	1	1	1.50	11.57	Pass

Seismic Analysis

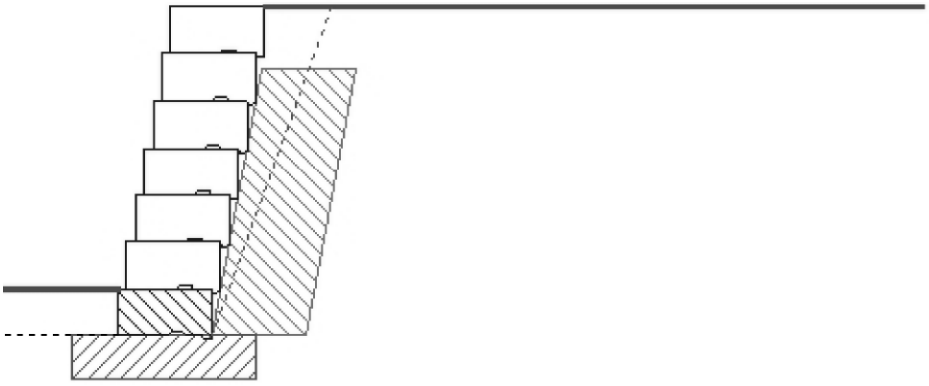
Test	Description	Section	Course	Minimum Requirement	Result	Status
FSsl	Base Sliding	1		1.10	1.18	Pass
FSbc	Bearing Capacity	1		1.10	27.53	Pass
FSot	Overturning	1		1.10	1.17	Pass
FSsc	Shear Capacity	1	1	1.10	8.22	Pass

Below Standard Values

Test	Description	Section	Course	Minimum Requirement	Result
MinHemb	Minimum Embedment	1		12.0000	5.8031

Section lower east Details

Section lower east Cross-section



Section lower east Cross-section Details

Upper Slope Angle	β	0.00 °
Crest Offset		0.00 ft
Live Load	ql	0 lb/ft²
Live Offset	qlofs	0.00 ft
Dead Load	qd	0 lb/ft²
Dead Offset	qdofs	0.00 ft
Peak Acceleration	As	0.15
Top of Section		3.50 ft
Bottom Grade		0.50 ft
Base of Section		0.00 ft
Design Height	H	3.50 ft
Embedment Depth	Hemb	0.50 ft

*** Embedment is included in Bearing Capacity**

Empirical Checks

Check	Description	Min. Requirement	Result	Status
Hemb	Minimum Embedment %	10.0000	16.6700	Pass
MinHemb	Minimum Embedment	12.0000	5.8031	Fail

External Checks

Static

Check	Description	Min. Requirement	Result	Status
FSbc	Bearing Capacity	2.00	19.68	Pass
FSot	Overturning	1.50	1.89	Pass
FSsl	Base Sliding	1.50	1.66	Pass

Seismic

FSbc	Bearing Capacity	1.10	27.53	Pass
FSot	Overturning	1.10	1.17	Pass
FSsl	Base Sliding	1.10	1.18	Pass

Internal and Local Checks

Static

Course	Elevation (ft)	FSsc
1	0.50	11.57
2	1.00	15.36
3	1.50	21.54
4	2.00	32.76
5	2.50	56.65

Course	Elevation (ft)	FSsc
6	3.00	123.88

Seismic

Course	Elevation (ft)	FSsc
1	0.50	8.22
2	1.00	10.56
3	1.50	14.18
4	2.00	20.29
5	2.50	31.91
6	3.00	59.11

Static Calculations

General Equations

Increase in height due to backslope	hs	0.00 ft	Eq. 7-7
Weight of column	W w	420.00 lb/ft	Eq. 6-18
Interface friction angle	δc	0.00 °	Eq. 6-2
Maximum height of slope influence	hmaxcon	3.50 ft	Eq. 6-4
Average slope within influence area	βcon	0.00 °	Eq. 6-5
External live load reduction factor	qlfactor	1.000	Eq.
External dead load reduction factor	qdfactor	1.000	Eq.
Active earth pressure coefficient	KaCon	0.195	Eq. 6-1
Active earth force due to soil weight	Ps	149.04 lb/ft	Eq. 6-6
Horz. active earth force due to soil weight	PsH	149.04 lb/ft	Eq. 6-9
Horz. active earth force due to dead load	PqdH	0.00 lb/ft	Eq. 6-11
Horz. active earth force due to live load	PqlH	0.00 lb/ft	Eq. 6-12
Total horz. active earth force	PaH	149.04 lb/ft	Eq. 6-13
Vert. active earth force due to soil weight	PsV	0.00 lb/ft	Eq. 6-14
Vert. active earth force due to dead load	PqdV	0.00 lb/ft	Eq. 6-15
Vert. active earth force due to live load	PqlV	0.00 lb/ft	Eq. 6-16
Total vert. active earth force	PaV	0.00 lb/ft	Eq. 6-17

Base Sliding

Masonry friction reduction factor	μ	0.700	Eq. Ref.25
Base sliding resistance	Rs	246.69 lb/ft	Eq. 6-19
Base sliding	FSsl	1.655	Eq. 6-20

Overturning

Resisting moment arm	X w	0.78 ft	Eq. 6-22
Resisting moment arm for PsH	Y s	1.17 ft	Eq. 6-24
Resisting moment arm for PqH	Y q	1.75 ft	Eq. 6-25
Resisting moment	Mr	327.90 lb-ft	Eq. 6-21
Driving moment	Mo	173.89 lb-ft	Eq. 6-23
Overturning	FSot	1.886	Eq. 6-26

Bearing Capacity

Bearing pressure	Qac	340.52 lb/ft²	Eq. 6-27
Equivalent footing width	Bc	1.23 ft	Eq. 6-28
Eccentricity of bearing force	e	0.13 ft	Eq. 6-29, 12-4
Eccentricity of column of SRW	e w	0.28 ft	Eq. 6-30, 12-5
Ultimate bearing capacity	Qult	6700.42 lb/ft²	Eq. 12-1
Bearing capacity	FSbc	19.677	Eq. 12-6

Internal Stability

Course	Elevation (ft)	Vu (lb/ft) [6-31]	FSsc [6-33]
1	0.50	1725.15	11.575
2	1.00	1681.55	15.356
3	1.50	1637.96	21.540
4	2.00	1594.37	32.760
5	2.50	1550.78	56.648
6	3.00	1507.18	123.875

Seismic Calculations

General Equations

Seismic inertial angle	θint	11.03 °	Eq. 9-3,4
Internal horz. acceleration coefficient	khint	0.195	Eq. 9-22,23
External horz. acceleration coefficient	khext	0.098	Eq. 9-24,25
External seismic inertial angle	θext	5.57 °	Eq. 9-27
Seismic active earth pressure coefficient	KaEcon	0.247	Eq. 9-26
Horz. component of earth pressure coefficient	KaEH	0.247	Eq. 9-28
Horz. component of dynamic coefficient	ΔKDynH	0.052	Eq. 9-29
Horz. total earth force	ΔPDynH	39.92 lb/ft	Eq. 9-31
Horz. dynamic earth force increment	PaEH	169.01 lb/ft	Eq. 9-32
Vert. component of earth pressure coefficient	KaEV	0.000	Eq. 9-33
Vert. component of dynamic coefficient	ΔKDynV	0.000	Eq. 9-34
Vert. total earth force	ΔPDynV	0.00 lb/ft	Eq. 9-36
Vert. dynamic earth force increment	PaEV	0.00 lb/ft	Eq. 9-35

Base Sliding

Seismic sliding resistance	Rscdyn	246.69 lb/ft	Eq. 9-37
Base sliding	FSsl	1.175	Eq. 9-38

Overturning

Resisting moment	Mr	327.90 lb-ft	Eq. 9-39
Driving moment	Mo	280.48 lb-ft	Eq. 9-40
Seismic overturning	FSot	1.169	Eq. 9-41

Bearing Capacity

Ultimate bearing pressure	Qult	6700.42 lb/ft²	Eq. 12-10
Applied bearing pressure	Qa	243.36 lb/ft²	Eq. 9-42
Applied bearing stress at leveling pad	B'c	1.73 ft	Eq. 9-43
Eccentricity of bearing force	e	-0.11 ft	Eq. 9-44
Bearing pressure	FSbc	27.532	Eq. 9-44X

Internal Stability

Course	Elevation (ft)	PaEHext (lb/ft) [9-46]	Vu (lb/ft) [9-47]	FSsc [9-45]
1	0.50	169.01	1725.15	8.217
2	1.00	124.17	1681.55	10.558
3	1.50	86.23	1637.96	14.184
4	2.00	55.19	1594.37	20.288
5	2.50	31.04	1550.78	31.914
6	3.00	13.80	1507.18	59.114

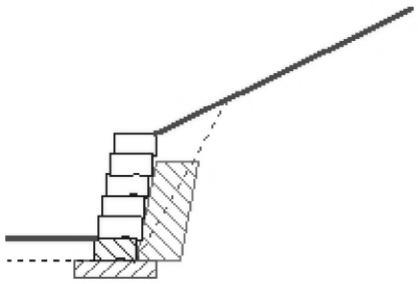
Project: G-5288 - Brar Residence

Site: 2190 140th Place SE, Bellevue, WA

Date: 11/30/2020

Section Summary Report

Section	upper east
Report Date	November 30, 2020
Designer	KJ
Design Standard	Rankine Theory Analysis
Design	Static and Seismic
Unit of Measure	U.S./Imperial
Selected Facing Unit	Product Line: Keystone Lip/Lug Systems Name: Regal Stone
Seismic As 0.15	Default Deflection of 2.00 inch



Soil Parameters Soil Zone	Phi Angle [degrees]	Cohesion [lb/ft²]	Unit Weight [lb/ft³]	Friction Factor	Description
Retained	36	0.00	125.00	n/a	
Foundation	36	0.00	125.00	n/a	
Leveling Pad	40	n/a	n/a	0.70	
Drainage	40	n/a	130	n/a	

Section Details

Section Height	3.00	Back Slope	26.00°	LL Surcharge	0	DL Surcharge	0
Design Height	3.00 ft	Crest Offset	0.00 ft	LL Offset	0.00 ft	DL Offset	0.00 ft
Embedment	0.50 ft	Wall Batter	10.60°	Toe Slope	0.00°	Toe Offset	0.00 ft

Minimum Factors of Safety

Conventional

External		Value	Internal		Value	Facing	Value
FSsl	Base Sliding	1.50	FSsl	Internal Sliding	1.50		
FSbc	Bearing Capacity	2.00	FSsc	Shear Capacity	1.50		
FSot	Overturning	1.50					

Seismic

Conventional

External		Value	Internal		Value	Facing	Value
FSsl	Base Sliding	1.10	FSsl	Internal Sliding	1.10		
FSbc	Bearing Capacity	1.10	FSsc	Shear Capacity	1.10		
FSot	Overturning	1.10					

Analysis Results

*** Embedment is included in Bearing Capacity**

External Static	FS			
Bearing Capacity	21.93	Bearing Pressure	318.87	lb/ft²
Overturning	2.73	Max Eccentricity	0.09	ft
Base Sliding	2.01			

External Seismic	FS			
Bearing Capacity	27.54	Bearing Pressure	253.95	lb/ft²
Overturning	1.58	Max Eccentricity	-0.11	ft
Base Sliding	1.34			

Internal Static Course	Elevation [ft]	Shear Capacity FS
1	0.50	13.70
2	1.00	19.22
3	1.50	29.24
4	2.00	50.55
5	2.50	110.55
6	3.00	

Internal Seismic Course	Elevation [ft]	Shear Capacity FS
1	0.50	8.80
2	1.00	11.91
3	1.50	17.20

Internal Seismic Course	Elevation [ft]	Shear Capacity FS
4	2.00	27.44
5	2.50	51.93
6	3.00	

Project: G-5288 - Brar Residence

Site: 2190 140th Place SE, Bellevue, WA

Date: 11/30/2020

Wall: Upper East Wall

Project Information

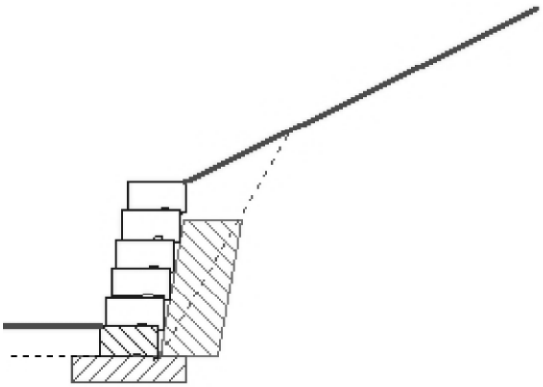
Client	GEO Group Northwest, Inc.				
Name	Brar Residence			**Number**	G-5288
Site	2190 140th Place SE, Bellevue, WA			**Designer**	KJ
Revision	1	**Created**	11/16/2020	**Modified**	11/30/2020
Standard	Rankine Theory Analysis				
Seismic As	0.15	Default Deflection of 2.00 inch			
Comments					

Selected Facing Unit

Product Line: Keystone Lip/Lug Systems
Name: Regal Stone

Project Summary

Tallest Section



Project Design Inputs

Design Standard Rankine Theory Analysis

Minimum Factors of Safety

Conventional

External		Value	Internal		Value	Facing		Value
FSsl	Base Sliding	1.50	FSsl	Internal Sliding	1.50			
FSbc	Bearing Capacity	2.00	FSsc	Shear Capacity	1.50			
FSot	Overturning	1.50						

Reinforced

External		Value	Internal		Value	Facing		Value
FSsl	Base Sliding	1.50	FSsl	Internal Sliding	1.50	FScs	Connection Strength	1.50
FSbc	Bearing Capacity	2.00	FSpo	Pullout	1.50	FSsc	Facing Shear	1.50
FSct	Crest Toppling	1.50	FSto	Tensile Overstress	1.50			
FSot	Overturning	2.00						

Seismic

Conventional

External		Value	Internal		Value	Facing		Value
FSsl	Base Sliding	1.10	FSsl	Internal Sliding	1.10			
FSbc	Bearing Capacity	1.10	FSsc	Shear Capacity	1.10			
FSot	Overturning	1.10						

Reinforced

External		Value	Internal		Value	Facing		Value
FSsl	Base Sliding	1.20	FSsl	Internal Sliding	1.20	FScs	Connection Strength	1.20
FSbc	Bearing Capacity	1.50	FSpo	Pullout	1.20	FSsc	Facing Shear	1.20
FSct	Crest Toppling	1.20	FSto	Tensile Overstress	1.20			
FSot	Overturning	1.50						

Design Factors

Term	Description	Minimum (as appl.)	Maximum (as appl.)
RC	Reinforced coverage ratio	1.00	0.00

Selected Facing Unit

Product Line: Keystone Lip/Lug Systems
Name: Regal Stone

Facing Height	Hu	0.50 ft
Facing Width	Lu	1.29 ft
Facing Depth	Wu	1.00 ft
Facing Weight	Xu	120 lb/ft³
Center of Gravity	Gu	0.50 ft
Setback	Δu	0.09 ft
Batter	ω	10.60 °
Cap Height	Hcu	0.00 ft
Initial Shear Capacity	au	1420.00 lb/ft
Apparent Shear Angle	λu	36.00 °
Maximum Shear Capacity	Vu(max)	4036.00 lb/ft

Selected Soil Types

Soil Zone	Phi Angle [degrees]	Cohesion [lb/ft²]	Unit Weight [lb/ft³]	Description
Reinforced	36	n/a	125.00	
Retained	36	0.00	125.00	
Foundation	36	0.00	125.00	
Leveling Pad	40	n/a	n/a	
Drainage	40	n/a	0.70	

Soil Glossary

CH:	Inorganic clays, high plasticity
CL:	Inorganic clays, low to medium plasticity, gravelly, sandy, silty, lean clays
GC:	Clayey gravels, poorly graded gravel-sand-clay mixtures
GM:	Silty gravels, poorly graded gravel-sand-silt mixtures
GP:	1/2"-3/4" clean crushed stone or crushed gravel
GW:	Well-graded gravels, gravel-sand. Little or no fines.
MH:	Inorganic clayey silts, elastic silts
ML:	Inorganic silts, very fine sands, silty or clayey, slight plasticty
SC:	Clayey sands, poorly graded sand-clay mixtures
SM:	Silty sands, poorly graded sand-silt mixtures
SP:	Poorly-graded sands, gravelly sands. Little or no fines.
SW:	Well-graded sands, gravelly sands. Little or no fines.

Analysis Summary

Lowest Values - Conventional

Static Analysis

Test	Description	Section	Course	Minimum Requirement	Result	Status
FSsl	Base Sliding	1		1.50	2.01	Pass
FSbc	Bearing Capacity	1		2.00	21.93	Pass
FSot	Overturning	1		1.50	2.73	Pass
FSsc	Shear Capacity	1	1	1.50	13.70	Pass

Seismic Analysis

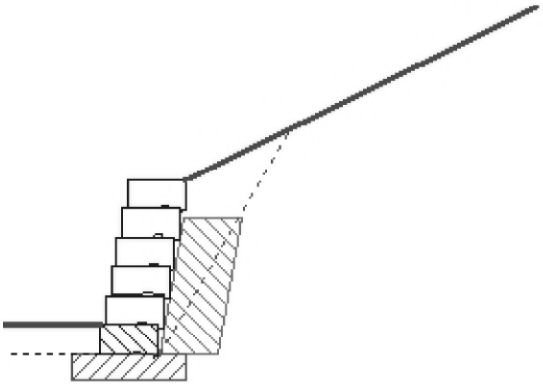
Test	Description	Section	Course	Minimum Requirement	Result	Status
FSsl	Base Sliding	1		1.10	1.34	Pass
FSbc	Bearing Capacity	1		1.10	27.54	Pass
FSot	Overturning	1		1.10	1.58	Pass
FSsc	Shear Capacity	1	1	1.10	8.80	Pass

Below Standard Values

Test	Description	Section	Course	Minimum Requirement	Result
MinHemb	Minimum Embedment	1		12.0000	5.8031

Section upper east Details

Section upper east Cross-section



Section upper east Cross-section Details

Upper Slope Angle	β	26.00 °
Crest Offset		0.00 ft
Live Load	ql	0 lb/ft²
Live Offset	qlofs	0.00 ft
Dead Load	qd	0 lb/ft²
Dead Offset	qdofs	0.00 ft
Peak Acceleration	As	0.15
Top of Section		3.00 ft
Bottom Grade		0.50 ft
Base of Section		0.00 ft
Design Height	H	3.00 ft
Embedment Depth	Hemb	0.50 ft

*** Embedment is included in Bearing Capacity**

Empirical Checks

Check	Description	Min. Requirement	Result	Status
Hemb	Minimum Embedment %	10.0000	20.0000	Pass
MinHemb	Minimum Embedment	12.0000	5.8031	Fail

External Checks

Static

Check	Description	Min. Requirement	Result	Status
FSbc	Bearing Capacity	2.00	21.93	Pass
FSot	Overturning	1.50	2.73	Pass
FSsl	Base Sliding	1.50	2.01	Pass

Seismic

FSbc	Bearing Capacity	1.10	27.54	Pass
FSot	Overturning	1.10	1.58	Pass
FSsl	Base Sliding	1.10	1.34	Pass

Internal and Local Checks

Static

Course	Elevation (ft)	FSsc
1	0.50	13.70
2	1.00	19.22
3	1.50	29.24
4	2.00	50.55
5	2.50	110.55

Seismic

Course	Elevation (ft)	FSsc
1	0.50	8.80
2	1.00	11.91
3	1.50	17.20
4	2.00	27.44
5	2.50	51.93

Static Calculations

General Equations

Increase in height due to backslope	hs	2.93 ft	Eq. 7-7
Weight of column	W w	360.00 lb/ft	Eq. 6-18
Interface friction angle	δc	26.00 °	Eq. 6-2
Maximum height of slope influence	hmaxcon	3.00 ft	Eq. 6-4
Average slope within influence area	βcon	26.00 °	Eq. 6-5
External live load reduction factor	qlfactor	1.000	Eq.
External dead load reduction factor	qdfactor	1.000	Eq.
Active earth pressure coefficient	KaCon	0.243	Eq. 6-1
Active earth force due to soil weight	Ps	136.52 lb/ft	Eq. 6-6
Horz. active earth force due to soil weight	PsH	122.70 lb/ft	Eq. 6-9
Horz. active earth force due to dead load	PqdH	0.00 lb/ft	Eq. 6-11
Horz. active earth force due to live load	PqlH	0.00 lb/ft	Eq. 6-12
Total horz. active earth force	PaH	122.70 lb/ft	Eq. 6-13
Vert. active earth force due to soil weight	PsV	59.85 lb/ft	Eq. 6-14
Vert. active earth force due to dead load	PqdV	0.00 lb/ft	Eq. 6-15
Vert. active earth force due to live load	PqlV	0.00 lb/ft	Eq. 6-16
Total vert. active earth force	PaV	59.85 lb/ft	Eq. 6-17

Base Sliding

Masonry friction reduction factor	μ	0.700	Eq. Ref.25
Base sliding resistance	Rs	246.60 lb/ft	Eq. 6-19
Base sliding	FSsl	2.010	Eq. 6-20

Overturning

Resisting moment arm	X w	0.73 ft	Eq. 6-22
Resisting moment arm for PsH	Y s	1.00 ft	Eq. 6-24
Resisting moment arm for PqH	Y q	1.50 ft	Eq. 6-25
Resisting moment	Mr	335.26 lb-ft	Eq. 6-21
Driving moment	Mo	122.70 lb-ft	Eq. 6-23
Overturning	FSot	2.732	Eq. 6-26

Bearing Capacity

Bearing pressure	Qac	318.87 lb/ft²	Eq. 6-27
Equivalent footing width	Bc	1.32 ft	Eq. 6-28
Eccentricity of bearing force	e	0.09 ft	Eq. 6-29, 12-4
Eccentricity of column of SRW	e w	0.23 ft	Eq. 6-30, 12-5
Ultimate bearing capacity	Qult	6993.42 lb/ft²	Eq. 12-1
Bearing capacity	FSbc	21.932	Eq. 12-6

Internal Stability

Course	Elevation (ft)	Vu (lb/ft) [6-31]	FSsc [6-33]
1	0.50	1681.55	13.704
2	1.00	1637.96	19.223
3	1.50	1594.37	29.236
4	2.00	1550.78	50.554
5	2.50	1507.18	110.549

Seismic Calculations

General Equations

Seismic inertial angle	θint	11.03 °	Eq. 9-3,4
Internal horz. acceleration coefficient	khint	0.195	Eq. 9-22,23
External horz. acceleration coefficient	khext	0.098	Eq. 9-24,25
External seismic inertial angle	θext	5.57 °	Eq. 9-27
Seismic active earth pressure coefficient	KaEcon	0.374	Eq. 9-26

Horz. component of earth pressure coefficient	KaEH	0.336	Eq. 9-28
Horz. component of dynamic coefficient	ΔKDynH	0.118	Eq. 9-29
Horz. total earth force	ΔPDynH	66.40 lb/ft	Eq. 9-31
Horz. dynamic earth force increment	PaEH	155.90 lb/ft	Eq. 9-32
Vert. component of earth pressure coefficient	KaEV	0.164	Eq. 9-33
Vert. component of dynamic coefficient	ΔKDynV	0.058	Eq. 9-34
Vert. total earth force	ΔPDynV	32.38 lb/ft	Eq. 9-36
Vert. dynamic earth force increment	PaEV	92.23 lb/ft	Eq. 9-35

Base Sliding

Seismic sliding resistance	Rscdyn	256.11 lb/ft	Eq. 9-37
Base sliding	FSsl	1.341	Eq. 9-38

Overturning

Resisting moment	Mr	356.00 lb-ft	Eq. 9-39
Driving moment	Mo	225.15 lb-ft	Eq. 9-40
Seismic overturning	FSot	1.581	Eq. 9-41

Bearing Capacity

Ultimate bearing pressure	Qult	6993.42 lb/ft²	Eq. 12-10
Applied bearing pressure	Qa	253.95 lb/ft²	Eq. 9-42
Applied bearing stress at leveling pad	B'c	1.72 ft	Eq. 9-43
Eccentricity of bearing force	e	-0.11 ft	Eq. 9-44
Bearing pressure	FSbc	27.538	Eq. 9-44X

Internal Stability

Course	Elevation (ft)	PaEHext (lb/ft) [9-46]	Vu (lb/ft) [9-47]	FSsc [9-45]
1	0.50	155.90	1681.55	8.804
2	1.00	108.27	1637.96	11.911
3	1.50	69.29	1594.37	17.201
4	2.00	38.98	1550.78	27.435
5	2.50	17.32	1507.18	51.932

GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists
& Environmental Specialists

April 8, 2021 G-5288

Bhupinder Brar
2190 140th Place SE
Bellevue, Washington 98007
Email: nyc_vick@yahoo.com
cc: hamidkorasani@yahoo.com

Subject: ADDENDUM LETTER
Proposed Retaining Walls
2190 140th Place SE
Bellevue, Washington 98007

Ref: "Geotechnical Engineering Study, Proposed Retaining Walls, 2190 140th Place SE, Bellevue, Washington 98007, G-5288, GEO Group Northwest, Inc., November 30, 2020."

City of Bellevue Development Services, Important Revision Submittal Information, Permit #: 20-112611, March 2, 2021."

Dear Mr. Brar,

We understand that the City of Bellevue has reviewed our geotechnical report and requested more information regarding the critical areas present at the project site. The following addendum letter includes a detailed response regarding the geologic aspects of the City of Bellevue Land Use Code Critical Areas Report Minimum Requirements listed in the above-referenced revision submittal letter dated March 2, 2021.

Critical Areas Report Minimum Requirements – LUC 20.25H.250.B

1. Identification and classification of all critical areas and critical area buffers on the site;

   According to the City of Bellevue Critical Hazards Maps, the above-subject property is entirely located within a very severe soil erosion hazard area that extends into the adjacent north, south, east, and west properties. The property also contains steep slopes with inclinations surpassing 40% adjacent to its southwest driveway, and throughout the east backyard area. The steep slope area within the back yard area has a total height of 25 feet extending from the east perimeter of the residence to the east property line, where the topography flattens. The east steep slopes are parallel to the east and west property lines, and their individual 50-foot top-of-slope buffers comprise the remaining non-steep portions of the back yard area. The existing steep slopes at the project site are illustrated in Plate 1 – Critical Areas Mapping.

2. Identification and characterization of all critical areas and critical area buffers on those properties immediately adjacent to the site;

   The steep slope areas (>40%) mapped at the project site are shown to extend into the adjacent north property. The steep slope mapped at the project site's southwest driveway area extends into the adjacent west property. The adjacent properties to the east and south are located within the project site's steep slope critical area 50-foot top-of-slope buffers, as the property's steep slopes extend to the respective property lines.

3. Identification of each regulation or standard of this code proposed to be modified;

   The proposed project seeks to obtain geologically-related modifications to the following critical areas standards and regulations outlined in the City of Bellevue Land Use Code:

   - Reduction to top of steep slope area buffer as noted in LUC 25H.120.B.1

- Development within a steep slope critical area per LUC 20.25H.055.

5. An assessment of the probable cumulative impacts to critical areas resulting from development of the site and the proposed development;

   The proposed tiered retaining walls in the property's east back yard area have been configured in a manner to minimize the extent of earthwork in the steep slope area, as shown in Plate 2- Site Plan. The two lower walls closest to the existing residence were constructed during the original development of the property. These walls are illustrated as "Existing keystone walls constructed at the time of house construction," and the non-permitted walls are titled "New keystone retaining wall," in Plate 3 – Existing Slope Cross Section. We observed during our site reconnaissance that the new retaining walls are stable in their existing condition, and our stability analysis of the retaining walls indicate that they have factors of safety against overturning or sliding that meet stability criteria (1.5 for the static condition, and 1.2 for the seismic condition). In our opinion, the cumulative impacts to the critical area posed by the proposed retaining walls will be minimal, provided that our soil erosion mitigation recommendations are properly implemented for the project.

7. A discussion of the performance standards applicable to the critical area and proposed activity pursuant to LUC 20.25H.160, and recommendation for additional or modified performance standards, if any;

   a. Structures and improvements shall minimize alterations to the natural contour of the slope, and foundations shall be tiered where possible to conform to existing topography;

      Response: The new retaining walls in the back yard area were constructed with heights less than 4 feet and are organized in a terraced system in order to reduce the extent of excavations and earthwork within the steep slope area, as illustrated in Plate 3 – Existing Slope Cross Section. The existing contours at the project site and the stability of the slope did not appear to be significantly altered by the new

retaining walls based on our site reconnaissance observations.

b. Structures and improvements shall be located to preserve the most critical portion of the site and its natural landforms and vegetation;

Response: The new retaining walls will provide erosion control that will protect the residence located at the toe of the slope, and plans for re-vegetation are intended to enhance the erosion control throughout the previously disturbed area. The retaining walls are appropriately spaced apart from each other so as not to impose additional surcharge loads on them. The disturbed areas behind the walls are relatively flat. The contours of the nearby unmodified steep slope areas are approximately parallel to the alignment of the new walls, as shown in Plate 2 – Site Plan.

c. The proposed development shall not result in greater risk or a need for increased buffers on neighboring properties;

Response: The proposed block walls do not pose a risk of adverse impact to the neighboring properties to the north and south. The slope is west-facing, so the adjacent properties are cross-slope from the walls. The adjacent property to the east will not be adversely impacted by the proposed development, as the new retaining wall near the east property line has a heigh of less than 3 feet and was constructed to the east of a relatively flat section of the property. The elevation view of this wall is shown in Plate 3 – Existing Slope Cross Section. Therefore, it is our opinion that increased buffers on neighboring properties are not needed in relation to the project.

d. The use of retaining walls that allow the maintenance of existing natural slope area is preferred over graded artificial slopes where graded slopes would result in increased disturbance as compared to use of retaining wall;

Response: As illustrated in Plate 2 – Site Plan, the retaining walls at the east back yard area are designed as a tiered system to minimize the disturbance to the natural contours of the steep slope area.

e. Development shall be designed to minimize impervious surfaces within the critical area and critical area buffer.

Response: In our opinion, the proposed retaining walls within the steep slope critical area do not create a significant amount of impervious surface that could adversely impact the critical areas present at the project site.

f. Where change in grade outside the building footprint is necessary, the site retention system should be stepped, and re-grading should be designed to minimize topographic modification. On slopes in excess of 40 percent, re-grading for yard areas may be disallowed where inconsistent with this criteria.

Response: Not applicable, based on the scope of this project.

g. Building foundation walls shall be utilized as retaining walls rather than rockeries ore retaining structures built separately and away from the building wherever feasible. Freestanding retaining devices are only permitted when they cannot be designed as structural elements of the building foundation.

Response: Not applicable, based on the scope of this project.

h. On slopes in excess of 40 percent, use of pol-type construction which conforms to the existing topography is required where feasible. If pole-type construction is not technically feasible, the structure must be tiered to conform to the existing topography and to minimize topographic modification.

Response: Not applicable, based on the scope of this project.

i. On slopes in excess of 40 percent, piled deck support structures are required where technically feasible for parking or garages over fill-based construction types.

Response: Not applicable, based on the scope of this project.

j. Areas of new permanent disturbance and all areas of temporary disturbance shall be mitigated and/or restored pursuant to a mitigation and restoration plan meeting the requirements of LUC 20.25H.210.

We understand that a landscaping and vegetation plan for the project is being prepared by others. We recommend that this plan incorporates the soil erosion mitigation measures that we present below in this letter.

8. A discussion of the mitigation requirements applicable to the proposal pursuant to LUC 20.25H.210, and a recommendation for additional or modified mitigation, if any;

Adverse impacts to the steep slope critical area on the project site can be mitigated by implementing the following elements:

a. Avoid unnecessary disturbance to slope areas that have inclinations steeper than 15 percent grade, particularly along the south portion of the property where disturbance has not occurred;

b. Use appropriate best management practices to control and direct surface water in disturbed areas to minimize soil erosion and sedimentation;

c. Cover stockpiled soils and any exposed slopes with plastic sheeting when not being worked;

d. Re-establish soil-stabilizing vegetation in disturbed areas for post-construction, long-term erosion control.

These recommendations should be incorporated into a critical areas revegetation/restoration plan for the proposed project.

9. Any additional information required for the specific critical area as specified in the sections of this part addressing that critical area.

Response: With regard to LUC 20.25H.145, it is our opinion that, based on the information and discussion provided above, the proposed project is geotechnically acceptable for receiving approval of modification to geologic hazard critical areas and critical areas buffers by the Director. Based on the conditions outlined in our above-referenced geotechnical report and the proposed project plans, the proposed retaining walls will not increase the threat of geologic hazards to adjacent properties or to other critical areas and the walls have been designed so that the stability of other existing structures will not be adversely impacted. The project plans comply with our typical recommendations for constructing retaining walls within sloping areas, and implementation of the above-recommended mitigation efforts will provide for minimization of the potential for soil erosion. Thus, the geologic hazard to the project or from the project to geologic critical areas or adjacent properties is mitigated to a level equal or less than that of the previous condition, in our opinion.

LIMITATIONS

Our findings and recommendations stated herein are based on field observations, our experience with similar projects, and our professional judgment. The recommendations presented in this letter are our professional opinion derived in a manner consistent with the level of care and skill ordinarily exercised by other members of the profession currently practicing under similar conditions in this area and within the project schedule and budget constraints. No warranty is expressed or implied. In the event that soil conditions are found to differ from those discussed in this report, GEO Group Northwest should be notified and the relevant recommendations in this report should be re-evaluated.

Sincerely,

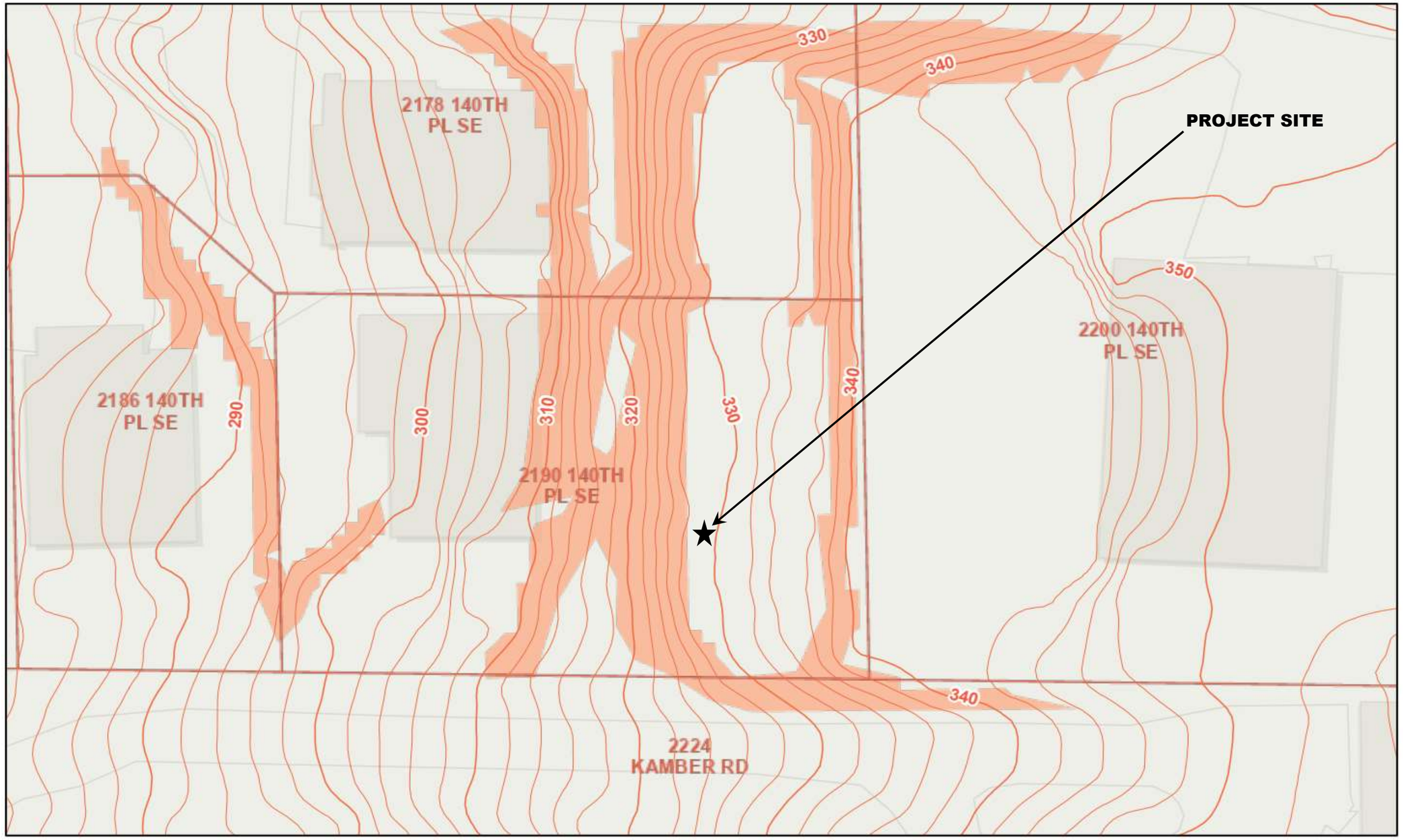
GEO Group Northwest, Inc.

Bryce Frisher, E.I.T.
Staff Geotechnical Engineer

William Chang, P.E.
Principal Engineer

Plates:

Plate 1 - Critical Areas Mapping
Plate 2 – Site Plan
Plate 3 – Existing Slope Cross Section



Parcels

Steep Slopes

0 0.01 0.01 mi

0.01 0.01 0.02 km

Source: City of Bellevue GIS Maps

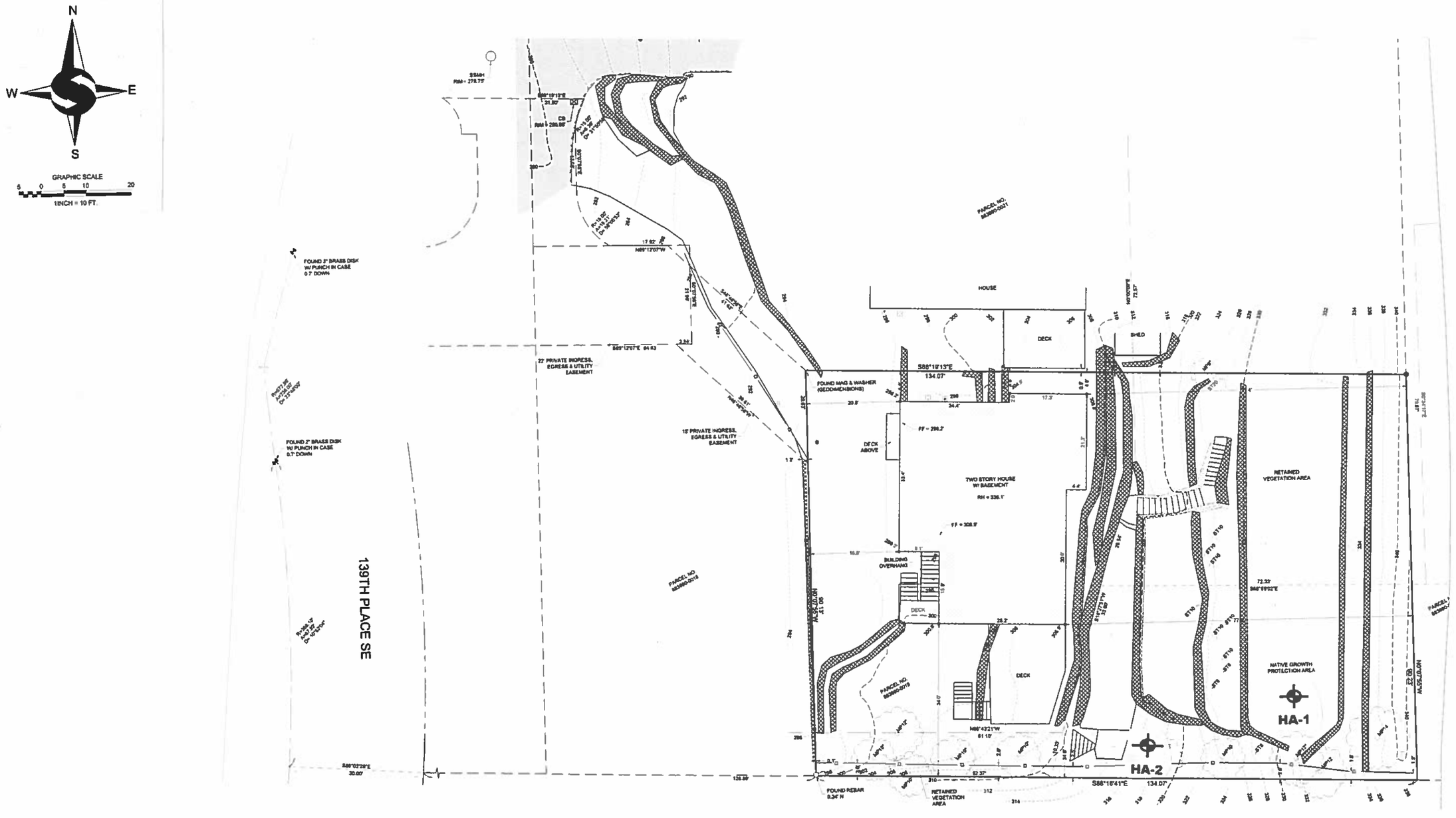
GEO Group Northwest, Inc.

Geotechnical Engineers, Geologists, & Environmental Scientists

CRITICAL AREAS MAPPING

PROPOSED RETAINING WALLS
2190 140TH PLACE SE
BELLEVUE, WASHINGTON

SCALE	AS SHOWN	DRAWN BY	BF	CHECKED BY	WC	DATE	4/1/2021	PROJECT NO.	G-5288	PLATE	1



LEGEND

HA-1 — EXPLORATORY SOIL BORING LOCATION

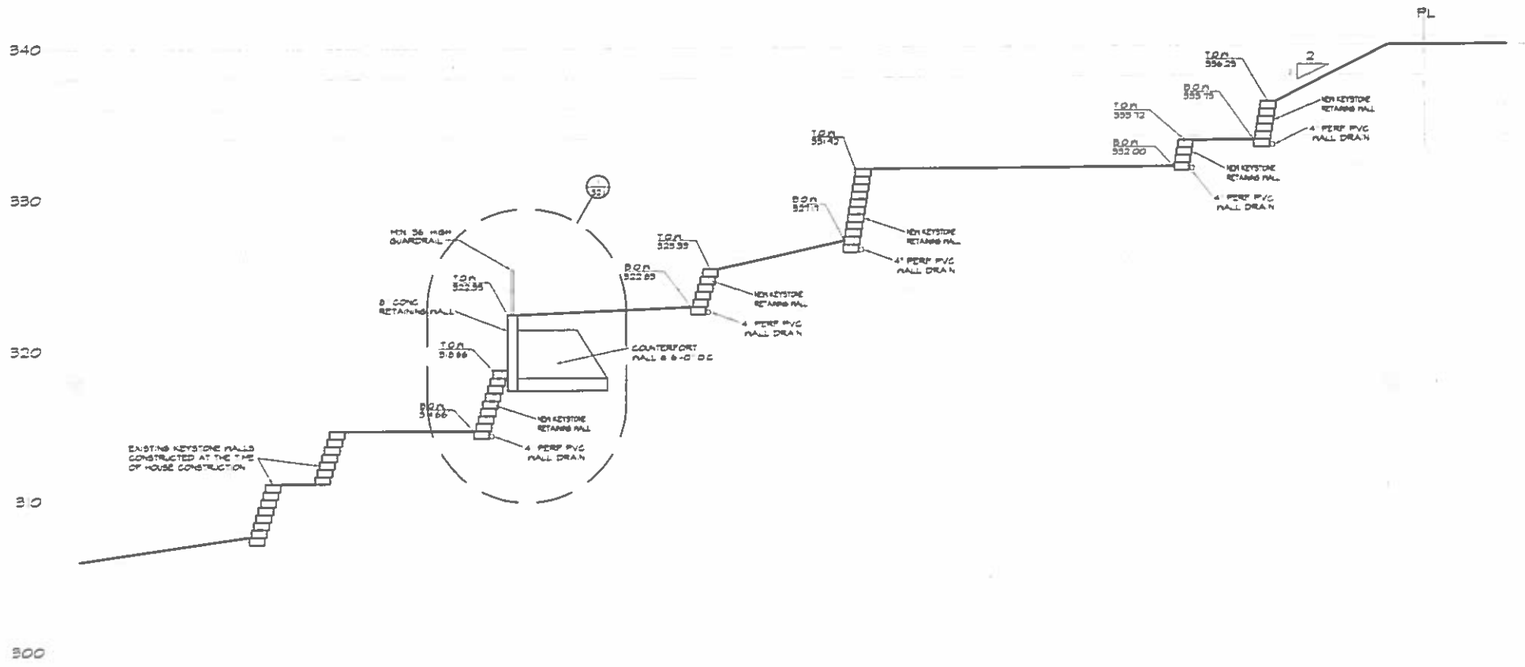
Source: Topographic Survey by Site Surveying, Inc., Dated 11/20/2020.

GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists, & Environmental Scientists

SITE PLAN

PROPOSED RETAINING WALLS
2190 140TH PLACE SE
BELLEVUE, WASHINGTON

SCALE	AS SHOWN	DRAWN BY	BF	CHECKED BY	WC	DATE	11/30/2020	PROJECT NO.	G-5288	PLATE	2



Source: Section, Brar / Kaur Residence by Sazei Design Group, LLC, Dated 11/24/2020.

GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists, & Environmental Scientists

EXISTING SLOPE CROSS SECTION

PROPOSED RETAINING WALLS
2190 140TH PLACE SE
BELLEVUE, WASHINGTON

SCALE	1" = 10'	DRAWN BY	BF	CHECKED BY	WC	DATE	11/30/2020	PROJECT NO.	G-5288	PLATE	3